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FIRST

ANNUAL REPORT

OF

THE TRUSTEES

OF THE

PEABODY ACADEMY OF SCIENCE,

JANUARY, 1869.

ACCOMPANIED BY A RECORD OF THE PROCEEDINGS OF THE TRUSTEES
FROM THEIR ORGANIZATION, MARCH, 1867.

PEABODY ACADEMY OF SCIENCE.
ORGANIZED. A.D. 1868.

SALEM:
PRINTED FOR THE ACADEMY.
1869.

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PEABODY MUSEUM OF AMERICAN
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GIFT OF
F. W. Putnam

Received Dec. 23, 1908.

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ESSEX INSTITUTE PRESS.

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TRUSTEES.

Asa Gray, Cambridge.
William C. Endicott, Salem.
G. Peabody Russell, Salem.
Othniel C. Marsh, New Haven.
Henry Wheatland, Salem.
Abner C. Goodell, Jr., Salem.
James R. Nichols, Haverhill.
Henry C. Perkins, Newburyport.
S. Endicott Peabody, Salem.

Finance Committee.—Messrs. Endicott, Russell and Peabody.

Executive Committee. — Messrs. Endicott, Wheatland, Goodell, Nichols and Perkins.

OFFICERS.

President.—W. C. Endicott.
Vice President.—Henry Wheatland.
Secretary.—A. C. Goodell, Jr.
Treasurer.—G. P. Russell.
Director of the Museum.—F. W. Putnam.
Curators.—Alpheus Hyatt, A. S. Packard, Jr., E. S. Morse.
Assistant.—Caleb Cooke.
Preparator.—Edwin Bicknell.
Treasurer's Clerk.—B. W. Russell.
Director's Clerk.—W. S. West.

COUNCIL.

The Council consists of the President, Vice President, Secretary Treasurer, Director and the Curators.

FIRST ANNUAL REPORT
OF THE
PEABODY ACADEMY OF SCIENCE,
JANUARY, 1869.

MR. PEABODY'S LETTER.

SALEM, MASS., Feb. 26, 1867.

TO FRANCIS PEABODY, Esq.; Professor ASA GRAY; WILLIAM C. ENDICOTT, Esq.; GEORGE PEABODY RUSSELL, Esq.; Professor OTHNIEL C. MARSH; Dr. HENRY WHEATLAND; ABNER C. GOODELL, jr., Esq.; Dr. JAMES R. NICHOLS; and Dr. HENRY C. PERKINS:—

GENTLEMEN, — As you will perceive by the enclosed Instrument of Trust, I wish to place in the hands of yourselves, and your successors, the sum of One Hundred and Forty Thousand Dollars, for the PROMOTION OF SCIENCE AND USEFUL KNOWLEDGE IN THE COUNTY OF ESSEX.

Of this, my native county, I have always been justly proud, in common with all her sons, remembering her ancient reputation, her many illustrious statesmen, jurists, and men of science, her distinguished record from the earliest days of our country's history, and the distinction so long retained by her, as eminent in the education and morality of her citizens.

I am desirous of assisting to perpetuate her good name through future generations, and of aiding through her means in the diffusion of science and knowledge; and, after consultation with some of her most eminent and worthy citizens, and encouraged by the success which has already attended the efforts and researches of the distinguished Scientific Association of which your Chairman is President, and with which most of you are connected, I am led to hope that this gift may be instrumental in attaining the desired end.

I therefore transmit to you the enclosed Instrument, and a check for the amount therein named ($140,000), with the hope that this Trust, as administered by you and your successors, may tend to advancement in intelligence and virtue, not only in our good old county of Essex, but in our Commonwealth, and in our common Country.

I am, with great respect,
Your humble servant,
GEORGE PEABODY.

INSTRUMENT OF TRUST.

I HEREBY give to **Francis Peabody**, of Salem; **Asa Gray**, of Cambridge; **William C. Endicott**, of Salem; **George Peabody Russell**, of Salem; **Othniel C. Marsh**, of New Haven, in the State of Connecticut; **Henry Wheatland**, of Salem; **Abner C. Goodell**, jr., of Salem; **James R. Nichols**, of Haverhill; and **Henry C. Perkins**, of Newburyport, the sum of One Hundred and Forty Thousand Dollars, to be by them and their successors held in trust, for the promotion, among the inhabitants of my native county of Essex, of the Study and Knowledge of the Natural and Physical Sciences, and of their application to the Useful Arts.

And I empower my said Trustees to make all such arrangements and agreements with the Corporation now established in the city of Salem under the name and title of the Essex Institute, as may be necessary or expedient for carrying into effect the provisions of this Instrument.

I direct that the sum of Forty Thousand Dollars, of the amount I have above given, shall be applied to the purchase of land in the city of Salem, the purchase of the East India Marine Hall, and the erection, fitting up, and furnishing of such buildings thereon as shall be necessary for the purposes of this Trust.

I further direct that the remaining sum of One Hundred Thousand Dollars be forever kept invested by my said Trustees and their successors as a permanent Fund, and only the income thereof be used for the purposes of this Trust.

In case the before mentioned sum of Forty Thousand Dollars shall be found insufficient, this income may be applied to the purpose of erecting such buildings as have been mentioned, the furnishing and arrangement of museums and collections, or such similar purposes as in the judgment of the Trustees shall be necessary to place the Institution on a proper basis for the benefit and instruction of the public; and it is my desire that the work of arranging a Museum and Collections be entered upon at an early day, and proceeded with as rapidly as can be done conveniently and advantageously.

After this shall have been done, the income shall be applied in the following proportions: — Seven-twelfths thereof to the department of the Physical Sciences and Practical Technology, and Five-twelfths thereof to the department of the Natural Sciences; but the Trustees, if after sufficient experience they shall find it desirable, may change these proportions, and, if at any time hereafter they shall be unanimously agreed upon the expediency of so doing, they may change the application and direction of the whole of said income as they may deem most conducive to the interest of Science and Learning in the county of Essex.

All vacancies in the Board of Trustees above constituted, by death, resignation, or otherwise, shall be filled, as soon as conveniently may be, by vote of the remaining Trustees.

The Trustees shall keep a record of their doings, and shall annually prepare a report setting forth the condition of the Trust and Funds, and the amount of income received and expended by them during the previous year. This report shall be signed by the Trustees, and made public in such manner as they shall think expedient.

I give to said Trustees the liberty of obtaining from the Legislature an Act of Incorporation, if they shall deem it desirable; to make all necessary By-laws, and all such regulations and restrictions as shall be necessary, in their judgment, for the preservation and maintenance of the Trust, and of all property or collections held under it; and generally to do whatever may be proper and necessary to carry into effect the provisions of this Trust.

I am, with great respect,
Your humble servant,
GEORGE PEABODY.

SATURDAY, MARCH 2, 1867.

A meeting of the Trustees named in the above "Instrument of Trust," was held this day in the Director's room of the Salem National Bank.

Francis Peabody, Esq., the first-named Trustee, called the meeting to order, and caused the letter of George Peabody, Esq., announcing the donation, by him, of one hundred and forty thousand dollars ($140,000) for the "Promotion of Science and Useful Knowledge in the county of Essex," to be read, and afterwards the letter explaining the terms of trust.

After this preliminary business, the names of the Trustees were called, and the following being present, severally accepted the Trust. — Francis Peabody, Asa Gray, William C. Endicott, Othniel C. Marsh, Henry Wheatland, Abner C. Goodell, jr., Henry C. Perkins and James R. Nichols.

The Board then organized by the choice of Francis Peabody, President; W. C. Endicott, Vice President; Abner C. Goodell, jr., Secretary; George Peabody Russell, Treasurer.

On motion of Prof. Gray, the following letter of acceptance by the Trustees was adopted, and it was voted, that the same be signed by the Trustees, and communicated to Mr. Peabody by the President.

REPLY OF THE TRUSTEES.

SALEM, MASS., March 2, 1867.

GEORGE PEABODY, Esquire: —

SIR, — We have the honor to acknowledge the receipt of your letter of the 26th of February, and the accompanying Instrument of Trust; and while fully appreciating this evidence of your confidence, and deeply sensible of the honorable and important duties we assume, we accept the appointment of Trustees of the sum of One Hundred and Forty Thousand Dollars, placed in our hands by you for the "Promotion of Science and Useful Knowledge in the county of Essex."

So wise and munificent a gift cannot fail to advance the general interests of sound learning, and to be productive of vast benefit to the people of this county.

The announcement will fill their hearts with the deepest sense of gratitude, not unmixed with pride, that the giver is one of themselves, born and educated upon their soil. They will read with pleasure your kind allusions to them, and your reference to the many illustrious sons of Essex, whose memory they cherish with tender regard.

And while you would perpetuate to future generations the good name of the county of Essex, be assured that yours will be cherished by her people, and be handed down to their children, not only as among the most distinguished of her sons, but as among the great benefactors of mankind.

On their behalf, and in behalf of the great cause of science and letters, for which you have everywhere done so much, we tender most cordial thanks.

We shall endeavor to manifest our full appreciation of the trust given us, by faithfully carrying out the objects and views which you have so clearly set forth.

In performing these duties, we trust that we may have the benefit of your counsel and advice. And we earnestly hope that you may long live to witness your good work, and that you may see accomplished all that you desire and intend by founding so beneficent a Trust.

With great regard, we remain,
Your obedient servants,

Francis Peabody,
Asa Gray,
William C. Endicott,
George Peabody Russell,
Othniel C. Marsh,
Henry Wheatland,
Abner C. Goodell, Jr.,
James R. Nichols,
Henry C. Perkins.

Voted, — That the Treasurer and Messrs. Endicott and Wheatland be a Committee on Finance.

Voted, — That the Executive Committee consist of the President, *ex-officio*, and Messrs. Gray, Wheatland, Nichols and Perkins.

On motion of Mr. Endicott, it was voted that the Finance Committee be authorized to complete, forthwith, all existing agreements with the East India Marine Hall Corporation, and with all other parties interested in the Marine Hall property, for a transfer of the same to this Board of Trustees, and also for the purchase of any land adjoining to the said Hall, concerning which any contract or agreement may have been made.*

SATURDAY, APRIL 13, 1867.

Meeting of the Trustees, this day, by request of the President.

Present, — Messrs. Peabody, Gray, Endicott, Marsh, Wheatland, Goodell, Nichols and Perkins.

On motion of Prof. Marsh it was voted to enlarge the Executive Committee, and Messrs. Endicott and Goodell were accordingly added.

On motion of Dr. Nichols it was voted that a sub-committee of three, consisting of Messrs. Endicott, Marsh and Wheatland, be appointed to meet and confer with any committee of the Essex Institute, and to report to the Board such plan as can be agreed upon for carrying out the purposes of the trust.

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* In contemplation of the donation of Mr. Peabody, agreements had previously been made with the East India Marine Hall Corporation, for the purchase of its building and land, and with other parties for lands adjacent thereto. Also with the East India Marine Society, for the deposit of its collections with the Trustees of the proposed fund.

Mr. Endicott reported from the Finance Committee that the Trustees had received a deed of the East India Marine Hall from the corporation of that name, and also a deed of some land adjacent thereto, as contemplated by the original agreements. He also presented a duplicate agreement between the Trustees and the East India Marine Society, to be signed by the Trustees. This agreement was read, approved and signed, as follows:—

THIS agreement, made this sixth day of April, A. D. 1867, by and between the Salem East India Marine Society, a corporation duly established by law at Salem, in the county of Essex, of the first part, and Francis Peabody, Asa Gray, William C. Endicott, Othniel C. Marsh, George Peabody Russell, Henry Wheatland, Abner C. Goodell, jr., James R. Nichols and Henry C. Perkins, Trustees as hereinafter named, of the second part, witnesseth:

That, whereas, the said parties of the second part have been appointed Trustees under a certain instrument of trust from George Peabody, Esquire, dated February 26th, A. D. 1867, for the objects and purposes therein named, among which objects named is the purchase of the East India Marine Hall in Salem, and the depositing therein, with the consent of the parties of the first part, as a trust forever, the Collections and Museum of said East India Marine Society:—And, whereas, the said Trustees have this day received a deed of said Hall, and the land under and around the same, from the East India Marine Hall Corporation, a corporation duly established by law at Salem, aforesaid, the party of the first part assenting to said conveyance, and cancelling a lease of said Hall held by them, and recorded with the Essex Deeds, book 239, leaf 244:—And, whereas, the said Society did, on December 27th, A. D. 1866, make an agreement in regard to the care and deposit of their collections and museum now in said Hall, which agreement was made in view of the aforesaid donation of George Peabody, Esquire, to said Trustees:—And, whereas, it is now proposed to deposit said collections and museum, with said Trustees, by this agreement:—And, whereas, said Trustees intend to alter said Hall, erect other buildings, add to said collections, and rearrange and combine the whole together:—Now, therefore, it is agreed by the parties hereto, in consideration of the foregoing, and of the mutual agreements and undertakings herein recited, that the museum and collections of said Society, now in said Hall, shall be deposited with the said Trustees, to be kept by them and their successors as a permanent deposit, upon the trust and confidence that the same shall be kept in said Hall by the said Trustees, or in a building equally as good, and properly cared for and arranged, as the deposit of said Society, giving to the same equal care and protection bestowed upon other collections, which the said Trustees will place or caused to be placed in said Hall, from the Essex Institute or other sources:—And it is further agreed, that all articles in said collections of an archæological or ethnological character, and such articles as have reference to the history of said Society, shall be arranged in cases upon the eastern side of the Hall, if practicable, and with the same shall be incorporated articles of a similar description belonging to the Essex Institute or other collections; and all articles relating to the natural sciences shall be deposited with the general collections in said Hall, in their respective departments; and all articles belonging to the collections of said Society shall be labelled and catalogued as the deposit of said Society; and in case any articles in said deposit shall become duplicates by the union of said collections with other collections, then the same may be exchanged, and all specimens received in exchange therefor shall be labelled and catalogued as aforesaid; and any articles which cannot be arranged under the departments heretofore named, or are unsuitable, or cannot be retained in the present Hall for want of room, or without injury to the arrangement, may be deposited in a lecture-room which the Trustees propose to build, or in Plummer Hall, or be held at the disposal of the Society.

And it is further agreed, that, upon the rearrangement of the collections, and the completion of the museum, as the Trustees propose, that the members of the East India Marine Society shall have the same right to visit, and to introduce their friends to visit the same, which they now have to their own museum; and in the event that the said Trustees shall require an admission fee to view the same, then the said Society shall receive such proportion of said admission fee as may be agreed upon by the parties hereto.

And it is further agreed, that the said Trustees shall furnish suitable rooms and accommodations, free of charge, for all business meetings of the officers and members of said Society, during the existence of said Society.

And it is further agreed, that, if any difference of opinion shall arise between the parties hereto in carrying out the provisions of this agreement, and the parties hereto are unable to agree, the same shall be left to the decision of three disinterested persons, whose decision in the premises shall be final.

And the parties hereto of the first and second part above recited, for themselves and their successors, bind themselves and their successors to each and all of the agreements and undertakings herein set forth.

In witness whereof, the said Trustees and the said East India Marine Society, by the hands of Charles Mansfield and Charles D. Mugford, thereto duly authorized and empowered by a vote of said Society, a copy of which is annexed hereto,* have hereunto set their hands and affixed their seals this sixth day of April, in the year of our Lord one thousand eight hundred and sixty-seven.

The Salem East India Marine Society, by

CHARLES MANSFIELD
CHARLES D. MUGFORD.

Witness, GEORGE WHEATLAND.

Trustees.
FRANCIS PEABODY.
ASA GRAY.
WILLIAM C. ENDICOTT.
OTHNIEL C. MARSH.
HENRY WHEATLAND.
GEORGE PEABODY RUSSELL.
ABNER C. GOODELL, JR.
HENRY C. PERKINS
JAMES R. NICHOLS.

Witnesses,
SIMON WINTER.
G. D. PHIPPEN.
B. W. RUSSELL.

Voted, — That the Finance Committee be authorized and instructed to consider and report upon the propriety of purchasing any real estate adjoining the land purchased by the Trustees of the East India Marine Hall Corporation and others.

On motion of Mr. Endicott it was voted, that the East India Marine Hall be opened to the Public from Tuesday the 16th to Wednesday the 24th inst.; and that the Hall be closed after that date until the rearrangement of the collections be concluded by the Trustees.

Voted, — That this be done under the direction of Dr. Wheatland, who is appointed a committee for that purpose.

On motion of Dr. Wheatland it was voted that a meeting of this Board may be called at any time by the President, Vice-President, or any two members upon notice thereof to the Secretary in writing.

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* At a meeting of the Salem East India Marine Society, duly notified and held on the sixth day of April, A. D. 1867, it was *Voted*, That Charles Mansfield and Charles D. Mugford be authorized, and they are hereby authorized to transfer, on special and permanent deposit, the Collections and Museum of the Society in the East India Marine Hall, to Francis Peabody and others, Trustees under the Trust of George Peabody, Esquire, according to the terms heretofore agreed upon, and to sign in behalf of the Society any agreement necessary therefore. *A true copy of record.* — THOMAS SAUL, Rec. Sec'y.

Adjourned to Tuesday, 16th instant.

Tuesday, April 16th, 1867.

The Trustees met this day according to adjournment. Present, — Messrs. Peabody, Gray, Endicott, Marsh, Wheatland, Goodell, Nichols and Perkins.

Mr. Endicott, Chairman of the Committee on Finance, reported on the subject of the purchase of real estate adjoining land in the rear of East India Marine Hall.

Dr. Wheatland reported his action on the vote authorizing the East India Marine Hall to be opened to the public, by which it appeared that the Hall was opened according to the vote of the Trustees, that notice thereof had been published in the papers, and that a suitable person had been placed in charge of the Hall during the exhibition, which it was desirable to continue till May 1, 1867. Accepted.

Voted, — That the President and Messrs. Gray, Marsh and Wheatland be a committee to appoint a Superintendent of the Museum, and to employ a suitable person or persons to arrange and catalogue the collections in the Hall, with authority to enter into such contracts as may be necessary therefore.

Thursday, May 16th, 1867.

Meeting of the Trustees this day, agreeably to the request of the President. Present, — Messrs. Peabody, Endicott, Russell, Marsh, Wheatland, Goodell, Nichols and Perkins.

The President reported that the committee had appointed Frederic W. Putnam Superintendent of the Museum, with authority to proceed with the work of taking down, securing, identifying, arranging and cataloguing the specimens held by the Trustees, also the charge of the Hall with power to use the several rooms in the building for the purposes of work and storage; to employ such assistants* as may be necessary, and to make a monthly statement of the progress of the work and of the expenses incurred.

On motion of Professor Marsh, it was voted that the foregoing appointment be ratified, and that Mr. Frederic W. Putnam be now chosen Superintendent of the Museum of the Trustees, with all the powers and duties set forth in the temporary appointment.

The President reported his action in regard to the purchase of real estate, whereupon it was voted that the President be authorized to purchase the "Goldthwaite house" and land for a sum not exceeding thirty-five hundred dollars ($3,500).

SATURDAY, JUNE 8, 1867.

Meeting of the Trustees this day, according to notice given, by request of the President.

Present,—Messrs. Peabody, Gray, Wheatland, Goodell, Nichols and Perkins.

After a full debate it was voted that the Finance Committee be authorized to have, forthwith, the East India Marine Hall fitted up, with central and wall cases according to the plans and estimates prepared under the supervision of the Superintendent of the Museum, with full and exclusive powers to act for this Board therein. It was further voted that the sum of twenty thousand dollars ($20,000) be placed at the disposal of the Finance Committee to defray the expense of preparing the East India Marine Hall, arranging the collections and all incidental outlays.

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*Alpheus Hyatt, Edward S. Morse, Alpheus S. Packard, Jr., and Caleb Cooke, Curators in the department of Natural History of the Essex Institute were appointed assistants; and the services of Thomas Saul and Joseph Hammond, members of the East India Marine Society were secured, the former an officer in that Institution for more than a quarter of a century.

The committee of conference, with a committee of the Essex Institute, reported that after several interviews with that committee, and having ascertained the views of its members on this subject, the following communication was addressed to its chairman:—

SALEM, May 21, 1867.

F. W. PUTNAM, Esq., *Chairman Com. of the Essex Institute*:

DEAR SIR,—After the full and satisfactory conference with your Committee on Friday evening, in relation to the deposit of the Natural History collection of the Institute with the Trustees, the undersigned, in behalf of the Trustees, submit the following proposal:—

The Trustees will take the collections and specimens in Natural History of the Institute upon special and permanent deposit, place them in East India Marine Hall, and keep them there or in a building equally as good in Salem, arrange and label them as the deposit of the Institute, and give to them the same care and attention which they give to other collections and specimens deposited in the same place of a similar character. The usual arrangement in regard to exchanges of duplicates being observed, and due credit therefor being given to the Institute. To the collections, when properly arranged in the said Hall, the members of the Institute are to have access, and the same privileges to study and examine the same which they now have under the rules and regulations of the Institute. All the expenses of removal, arrangement and care, to be borne by the Trustees.

The Trustees will also pay to the Institute the sum of one thousand dollars for the ten table and upright cases, now standing in the Museum of the Institute, and the shelving in the permanent cases of the Museum, upon which a portion of the collection is now arranged.

Articles of agreement upon the above basis should be drawn and executed by the parties.

In behalf of the Trustees the undersigned would repeat, what they have before stated, that it will give the Trustees great pleasure thus to coöperate with the Institute in a common object. It promises most favorably for their future harmony of action, and seems to insure the establishment of an institution, which, drawing its life and strength from the well-earned position of the Institute, the zeal and activity of its members, and the large and munificent gift of Mr. Peabody, will be an honor to the county and a source of great benefit to its people.

It is hardly necessary to state in detail the action which the Trustees intend to take. The arrangement of the Museum requiring at once a large outlay, the erection, as soon as practicable, of a lecture hall and laboratories for the chemical and natural history departments, and such other buildings as may be necessary. All this has been stated in our conference with you.

And the undersigned will say in conclusion that the Trustees are especially desirous of coöperating with the members of the Institute in carrying out the great objects of their trust, in promoting some of which in the past the Institute has attained so much distinction, and hope that you will agree to the above proposal.

Very truly yours,
WILLIAM C. ENDICOTT,
OTHNIEL C. MARSH,
HENRY WHEATLAND,

This communication covered a proposal wholly acceptable in its substance and details, and was submitted in the report of that committee at a special meeting of the Essex Institute, held on Friday, May 24, and was unanimously adopted. The committee also presented a duplicate agreement between the Trustees and the Essex Institute, to be signed by the Trustees. This agreement was read, approved, and signed, as follows: —

An agreement made by the Institute through its Committee of three, with the Trustees of the Peabody Fund:

"This agreement, made this twenty-ninth day of May, A. D., eighteen hundred and sixty-seven, by and between the Essex Institute, a corporation duly established by law at Salem in the county of Essex and Commonwealth of Massachusetts, party of the first part, and Francis Peabody, Asa Gray, William C. Endicott, Othniel C. Marsh, George Peabody Russell, Henry Wheatland, Abner C. Goodell, jr., James R. Nichols, and Henry C. Perkins, Trustees as hereinafter named, parties of the second part, witnesseth, —

That whereas the said parties of the second part have been appointed Trustees under a certain instrument of trust, given by George Peabody, Esq., on the 26th day of February, A. D., eighteen hundred and sixty-seven, for the objects and purposes therein named, and for said purposes are empowered to make arrangements and agreements with the said Essex Institute.

Now, therefore, it is agreed by and between the parties hereto, in consideration of the foregoing and of the mutual agreements and undertakings herein recited, that the scientific collections of the said Essex Institute shall be deposited with said Trustees, upon a special, permanent deposit and trust, to be kept by them and their successors forever in the East India Marine Hall, so-called, in said city of Salem, or in some other building equally as good, and located in said city; said scientific collections to be properly cared for and arranged according to such methods as shall, in the judgment of said Trustees, make them most available for the benefit and instruction of the public, and to receive the same attention which the said Trustees may give to other collections and specimens of a similar character which they may at any time hold or acquire; to be labelled with the name and as the collections of the Essex Institute, and catalogued as such; that all specimens similar to those forming the collections now deposited by the Institute, which may hereafter be received by the Institute, shall be deposited with said Trustees, and shall be by them received and treated in all respects like specimens in the original deposit; that duplicates now embraced, or hereafter to be embraced in said collections, and any specimens which may become duplicate, by the placing of said collections in the same building with other collections of like nature, may be exchanged by said Trustees according to the usual custom of exchanges of duplicates; and all articles and specimens received in exchange therefor shall be labelled and catalogued as aforesaid, and shall be held and kept by the said Trustees and their successors forever, together with the original deposit of which they shall become a part, for the promotion of science and useful knowledge among the inhabitants of the county of Essex.

And it is further agreed, that upon the rearrangement of the said collections by the said Trustees as aforesaid, the officers and members of the Essex Institute shall have free access to, and the same rights and facilities to use, study and improve their said collections, under such proper regulations as may be imposed by said Trustees, which they now enjoy under the rules and regulations of the Institute; and it is further agreed that if any difference of opinion shall arise between the parties hereto as to the manner of carrying out this agreement, and the parties hereto are unable to agree, such difference shall be referred to the decision of three disinterested persons, whose decision in the premises shall be final. And to the carrying out of each and all of the agreements and undertakings herein set forth, the parties of the first and second part bind themselves and their successors firmly by these presents.

In witness whereof the said Essex Institute, party of the first part, hath caused these presents to be executed in its name, and its corporate seal to be affixed to the same by Samuel P. Fowler, Henry F. King, and Robert S. Rantoul, thereto being duly authorized by a vote of said corporation, a copy whereof is hereto annexed.*

And the said Trustees, parties of the second part, have severally affixed their hands and seals."

The Essex Institute by

SAMUEL P. FOWLER,
HENRY F. KING,
ROBERT S. RANTOUL, } [Seal of the Essex Institute.]

FRANCIS PEABODY, [L. S.]
ASA GRAY, [L. S.]
WILLIAM C. ENDICOTT, [L. S.]
OTHNIEL C. MARSH, [L. S.]
GEORGE PEABODY RUSSELL, [L. S.]
HENRY WHEATLAND, [L. S.]
ABNER C. GOODELL, JR., [L. S.]
JAMES R. NICHOLS, [L. S.]
HENRY C. PERKINS, [L. S.]

SATURDAY, NOVEMBER 9, 1867.

Meeting of the Trustees this day, agreeably to the request of the Vice President, to take suitable notice of the decease of the President, Francis Peabody, Esq.

Present, — Messrs. Gray, Endicott, Russell, Wheatland, Goodell, Nichols.

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* At a special meeting of the Essex Institute duly notified and held on Friday May 24, 1867, the following votes were unanimously adopted:

Voted, — That the Scientific Collections of the Institute be deposited with the Trustees of the Peabody Fund, as proposed in the Report of the Committee, and that a Committee of three be appointed to carry out the plan, with full power to sign all papers necessary therefor in behalf of the Institute.

Voted, — That the same Committee be authorized to carry out all the other details of the plan proposed by the Trustees, and have power to sell the upright and table cases now in the centre of the large hall in the Museum, and the painted shelving in the other cases in the same room; also, to make the same agreement extend to all future additions that may be hereafter made to the Natural History Collection,

SAMUEL P. FOWLER, HENRY F. KING, and ROBERT S. RANTOUL were appointed as the Committee.

Mr. Endicott stated that, since our last meeting, we have sustained a great loss in the death of our President, Mr. Francis Peabody; a loss not to us alone and individually, but to the Institution we represent, and to the cause of sound learning and popular knowledge in this county. You all probably remember that, at the last meeting of this Board, Mr. Peabody was in failing health; his malady continued to increase during the summer and early autumn. On the twenty-first of September he was confined to his house, and his sufferings ended with his death, on the thirtieth of October.

When we consider how closely he has been identified with this institution and its honored founder—how much he did to create and fashion it, how zealously he put his hand to the work, how bright and glowing were his hopes for its future—we cannot but feel that one strong arm that we need is gone, and that one of the lights of our pathway is put out. It is not the occasion now, for an elaborate address upon his character and life, and it would take time to collect the necessary material, but I thought it proper for the Trustees to assemble at this early day to take suitable notice of their loss, and to express their appreciation of his character. I am happy to announce that the Essex Institute, of which society Mr. Peabody was also president, has requested Mr. Upham to prepare a memorial paper, which will be at once a tribute to his memory and a record of his life and work. That life was a busy one, and the work, with which he filled it, hastened its close. His last year was full of labor and sorrow. A terrible affliction saddened his heart, yet all the while he was immersed in the anxieties of business, in perfecting incomplete enterprises and inventions, in inaugurating new experiments, and in developing this institution. He gave himself no rest. With all this to weigh upon his strength was added the insidious advance of the disease of which he died. Yet all of us can remember his buoyant, cheerful, hopeful spirit, the sunny smile with which he greeted us, his forgetfulness of self, and his thoughtfulness for others. The last time I saw him, when he was able to speak of business matters, he had many plans and schemes for the welfare of this institution, and for assisting the *American Naturalist*, in which he took a great interest; and he said that, as soon as he was able, he should call a meeting of the Trustees having many proposals to make to them. Engrossed as he was, and eagerly as he pursued the special matters, which he had in hand, he was ever ready to consider and examine all subjects of larger and more general interest. Everything relating to the useful arts — to architecture, to invention, to experiment, to machinery, to chemistry, to the application of science to the affairs of life — had a peculiar charm for him. His knowledge, in all these fields, was large and various, and was both theoretical and practical. Probably few men in this community had oftener put theory to the test of practice and experiment. His mind was active and retentive, his understanding was vigorous and strong, his powers of observation were large, and he grasped at things rather by a rapid intuition than by long and laborious study. His taste was accurate and sensitive, and he was keenly alive to the beautiful, both in nature and art.

Of his personal qualities I hardly dare trust myself to speak. A friendship from my earliest childhood, unbroken, constant, true, — that has no unkind word to forget, and a thousand kind words and acts to treasure and remember, — might make me too partial, and call up thoughts too tender and private for this hour and place. It is perhaps enough to say that he left no enemies, that he had many friends, that, without being a public man, he is mourned in his native city as a public loss, and that, in the sacred circle of home, upon the sanctity of which, in this moment of bereavement, we would not enter, he was all that man should be.

I would suggest that a committee be appointed to draw up a series of resolutions, or take such other action as may seem to the Board most proper.

Dr. Wheatland spoke of Mr. Peabody's early interest in the study of chemistry and the kindred sciences, and their application to the useful arts; also his great desire to advance all movements for the diffusion of scientific knowledge, and a high degree of culture in the community. Thus when the Essex Lodge of Free and Accepted Masons, and the Salem Charitable Mechanic Association decided, in the latter part of the year 1827, to have lectures delivered before their respective members and friends, he took a prominent part, and delivered several on the Steam Engine, Electricity and similar subjects, before each institution. The success attending these courses of lectures induced several gentlemen of Salem to establish, in January 1830, the Lyceum. In this he also took a leading part, was on the first board of management, and delivered lectures on his favorite studies. These institutions may be considered as having made an early, if not the first, movement in the general introduction of popular and instructive lectures, which have been since so universally adopted in this country. Allusions were then made to his efficient and zealous membership in the Essex Institute, of which institution, he was chosen president, in May 1865, and has since annually been elected to that office; also to the contributions which he made before and during his official connection with that body, in the promotion of its objects. Other associations, deserving of public regard, always received his sympathy and kindly consideration. His very active and inventive mind was not only occupied in the conducting of experiments in the Physical Sciences, or in the invention of machinery useful in the arts, but in the introduction of new manufactures, and those commercial enterprises that add so largely to the welfare and prosperity of a community.

The decease of our President will be a great loss, not only to our literary and scientific institutions, but to the community in which he had spent an active and useful life. May the recollections of his enterprise and zeal inspire us to greater exertions in the proper organization of this institution, now in its incipient stage, and thus be enabled to accomplish in the highest degree, the laudable designs of the founder of this trust for the promotion of science and useful knowledge in the county of Essex.

Professor Gray and other members testified, in a few appropriate remarks, their high estimation of his character, and a due appreciation of his valuable services in the cause of science, especially for his energy and zeal in organizing this institution, and in maturing as far as practicable, the plans which had been devised for its establishment on a sure and permanent basis for future usefulness.

A committee of three, consisting of Messrs. Goodell, Russell and Wheatland, was then appointed to prepare a series of resolutions in accordance with the opinions herein expressed, for adoption by this Board.

Mr. Goodell in presenting the following resolutions, paid a merited tribute to his memory, in a few briet remarks:

Resolved,—That by the decease of the late President of this Board, his associates are deprived of the counsel and assistance of the person upon whom Mr. George Peabody chiefly relied, in establishing the fund which he has entrusted to this Board to administer; and that this Board hereby expresses its profound sorrow and regret at losing thus suddenly, the benefit of the untiring zeal and large experience of the deceased, at a time when the organization of the Board, and the plans to be pursued, in carrying out the donor's wise and liberal purposes, are in their inception.

Resolved,—That this Board deeply sympathizes with the family of the deceased in their afflicting loss; and the community in which he lived and was eminent as an active, enterprising and intelligent promoter of sound learning and the industrial arts.

Resolved,—That this Board accepts the invitation of the Essex Institute, to unite with that body in the commemorative services which they have proposed in their resolutions.

Resolved,—That copies of these resolutions be presented to the family of the deceased, and to Mr. George Peabody of London.

The resolutions were then unanimously adopted.

MONDAY, JANUARY 13, 1868.

The Trustees met agreeably to notice, this day. Pressent, — Messrs. Endicott, Russell, Marsh, Wheatland, Goodell, Nichols, Perkins.

Mr. Endicott reported from the Executive Committee, that that committee had caused to be prepared the draft of an act to incorporate the Trustees under the name of the Peabody Academy of Science. Although no formal vote had been passed by the Trustees on the subject, the committee thought it to be their duty to present the matter in a form which could be acted upon at once, as longer delay would prevent an act being obtained at this session of the Legislature. The act was drawn under the advice of able counsel, Messrs. Choate and Perry, and it is their opinion that it is in strict conformity with the letter of Trust, and such an act as the Trustees can lawfully apply for and accept.

Voted,—To adopt the name of the Trustees of the Peabody Academy of Science.

Voted,—On motion of Mr. Russell, that a committee of two be appointed by the chair, to present a petition to the Legislature, asking for the passage of an act of incorporation, in accordance with the draft reported. And Drs. Nichols and Wheatland were appointed. It was then voted that the chairman and secretary be added thereto.

Several subjects relating to the finances were discussed, and the representation of the Editors of the *American Naturalist* * of their need of some pecuniary assistance was submitted for consideration. This last subject was referred to Professor Marsh, to report upon at an adjournment of this meeting to be held on Tuesday, 14th inst., at 3.15 P. M.

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* The *American Naturalist*, a popular illustrated magazine of Natural History, published by the Essex Institute, Salem; A. S. Packard, jr., A. Hyatt, E. S. Morse, and F. W. Putnam, Editors. It is devoted to the popular exposition of scientific topics in such a manner as to avoid those technicalities which often render the mass of such reading tedious and difficult; a work of this character supplies a long existing demand, and cannot fail of proving a great aid to the student, the amateur, and the general reader. The first number was issued in March, 1867, and was well received by the press, the scientific men, and the public generally, throughout the country.

TUESDAY, JANUARY 14, 1868.

The Board met at the time and place designated in the vote adjourning the last meeting. Present,—Messrs. Gray, Endicott, Russell, Marsh, Wheatland, Goodell, Nichols, Perkins.

Professor Marsh reported that he had examined the subject referred to him, and, in conference with the editors, had ascertained that the *Naturalist* had always been favorably noticed by the press, and held in high estimation by the scientific public, who have extended to it a liberal patronage for a work in the first year of its existence. To ensure ultimate success, temporary assistance is necessary, and he, therefore, would recommend the granting of a loan, to be secured by a mortgage of the publication, its copy right, stereotype plates, &c.

This subject elicited a full discussion, and the opinions of the members were freely expressed in regard to the merits of the work, and its great utility as a vehicle for the development and cultivation of a taste for the study of the natural sciences.

Voted,—On motion of Dr. Nichols, that the Finance Committee be authorized to lend to the *Naturalist* the sum of four thousand dollars ($4000) on such security as they may deem sufficient.

Voted,—That Samuel Endicott Peabody of Salem, be chosen to fill the vacancy in this Board, caused by the decease of our late President, Francis Peabody. This vote was then taken by ayes and nays, and was passed unanimously.

Voted,—On motion of Professor Marsh, that the Finance Committee be instructed to take immediate measures to guard against liability to fire, within and without the Museum building.

SATURDAY, JULY 18, 1868.

A meeting of the Trustees, duly notified, was held this day. Present,—Messrs. Gray, Endicott, Russell, Marsh, Wheatland, Goodell, Nichols, Perkins, Peabody.

Mr. Samuel Endicott Peabody having accepted the appointment of Trustee, was present at this meeting.

Mr. Endicott reported, as chairman of the Finance Committee, that a loan of four thousand dollars ($4 000), taken from the Fund that was appropriated for the erection of additional buildings and for other purposes, had been made to the *American Naturalist*,* and read the articles of agreement under which that loan was made and secured.

Dr. Wheatland, of the committee to take suitable precautions against fire, reported that iron shutters had been placed at all the windows on the eastern and western sides of the building, and mentioned other necessary measures that had been taken.

After a report of the committee on Finance had been read by Mr. Endicott, it was voted, on motion of Professor Marsh, that an additional sum of eight thousand dollars ($8 000) be appropriated to defray expenses upon the East India Marine Hall, and the Museum of the Academy.

The chair then read the Act of Incorporation, granted by the Legislature at its last session, which was accepted on motion of Professor Marsh, seconded by Professor Gray. The vote was taken by yeas and nays, and was unanimous.

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* The first number of the second volume of the *American Naturalist*, for March 1868, was issued as a Publication of the Peabody Academy of Science. The organization of the Academy, with objects identical with some of those of the Essex Institute, relieved the latter institution of a portion of its duties, which have accordingly been transferred to the former, including all its interests in the Naturalist.

AN ACT TO INCORPORATE THE TRUSTEES OF THE PEABODY ACADEMY OF SCIENCE.

Be it enacted, &c., as follows:

SECTION 1. Asa Gray, of Cambridge, William C. Endicott, of Salem, George Peabody Russell, of Salem, Othniel C. Marsh, of New Haven, in the state of Connecticut, Henry Wheatland, of Salem, Abner C. Goodell, junior, of Salem, James R. Nichols, of Haverhill, and Henry C. Perkins, of Newburyport,—surviving persons named as trustees in an instrument of trust given to Francis Peabody and others by George Peabody, of London, on the twenty-sixth day of February, in the year eighteen hundred and sixty-seven,—together with S. Endicott Peabody, of Salem, and such other persons as shall be, in accordance with the terms of said instrument of trust, elected to fill any vacancies thereunder, are hereby made a corporation in the county of Essex, by the name of The Trustees of the Peabody Academy of Science, for the promotion of science and useful knowledge; with all the powers and privileges, and subject to all the duties and liabilities set forth in all general laws which now are or may hereafter be in force, and applicable to such corporations: *provided*, that they shall not be subject to any duties or liabilities inconsistent with said instrument of trust.

SECTION 2. Said corporation may hold, invest and control the money given by said George Peabody by the instrument of trust before mentioned, and any proceeds from the same; may assume, succeed to and carry out all contracts and agreements made by said trustees under said instrument of trust; and may hold real and personal estate to an amount not exceeding three hundred and fifty thousand dollars.

SECTION 3. Said corporation is hereby authorized to take and receive, by gift, grant, bequest, devise or otherwise, any lands, tenements or other estate, real or personal, to have and to hold the same for themselves and their successors, upon the terms and for the purposes specified in the instrument of trust aforesaid; and also upon such terms and for such purposes and trusts as may be expressed in any deed or instrument of conveyance, or gift, to them made: *provided*, the same shall not be inconsistent with the terms and purposes of the instrument of trust executed to them by the said George Peabody.

SECTION 4. Upon the dissolution of this corporation, its rights and properties shall be and vest in the aforesaid board of trustees, under said instrument of trust from George Peabody, subject only to be taken to pay the debts of the said corporation.

SECTION 5. This act shall take effect upon its passage.

Approved April 13, 1868.

The Executive committee submitted a draft of By-Laws, which, after some discussion, was referred to a committee of five nominated by the chair, to report thereon at a future meeting; the committee named were Messrs. Wheatland, Marsh, Peabody, Nichols and Russell.

On motion of Professor Marsh—*voted*, that until a plan of organization be definitely accepted, the officers of the Board of Trustees be requested and authorized to continue to act in their several capacities with the same powers heretofore conferred.

On motion of Mr. Peabody—*voted*, that when we adjourn, we adjourn to Saturday, Sept. 12th, at 11 A. M.

On motion of Dr. Wheatland—*voted*, that this Board unite with the Essex Institute in inviting the American Association for the Advancement of Science to hold its annual meeting for 1869 at Salem.

In the afternoon the Board attended, by invitation, a special meeting of the members of the Essex Institute, which was held at their rooms in Plummer Hall, for the purpose of attending to the reading of a memoir by Hon. Charles W. Upham, on the life and character of their late President, Francis Peabody.

SATURDAY, SEPTEMBER 12, 1868.

The Board met this day as by adjournment. Present,—Messrs. Endicott, Russell, Marsh, Wheatland, Goodell, Perkins, Peabody.

After the reading of the records of the last meeting, the committee to whom was referred the consideration of the By-laws, reported a draft, which, after sundry amendments, was adopted:

BY-LAWS.

I. OFFICERS.

The Officers of the Corporation shall consist of a President, Vice President, Secretary, Treasurer, and Finance and Executive Committees, who shall be elected at the Annual Meeting in January.

II. COMMITTEES AND THEIR DUTIES.

The Executive Committee shall consist of five members, the President and Secretary being members *ex officiis*.

The Finance Committee shall consist of three members, the President and Treasurer being members *ex officiis*.

The Treasurer, with the advice of the Finance Committee, shall manage all the funds and invested property of the Corporation, and approve all bills incurred in the management thereof. The Executive Committee shall manage all property not held as an investment, superintend the erection, enlargement and repair of buildings used for the purposes of the trust, and approve all bills incurred by their order, or by the vote of the Corporation.

III. THE COUNCIL.

The Council shall consist of the President, Vice President, Secretary and Treasurer of the Corporation, together with the Director of the Museum, and such officers in charge of the several departments as the Corporation may designate.

IV. THE DIRECTOR AND OFFICERS.

The Corporation shall choose an officer to be called the Director of the Museum, and such other officers as may be necessary, whose duties shall be fully defined by the Council.

The Director of the Museum and the officers, or either of them, may at any time be removed from office by the vote of the Corporation at any meeting duly called.

V. THE MUSEUM.

The Collections deposited with the Trustees of the Peabody Fund by the East India Marine Society and the Essex Institute, shall be kept and maintained according to the terms of the agreements made with the depositors, respectively, under the direction of the Council; and the Council shall make all necessary rules for the exchange of specimens, the care, enlargement and use of the collections, and the exhibition of the same to the public.

VI. LECTURES.

The Council shall establish courses of scientific lectures, to be given, under the auspices of the Trustees, in such places in the county of Essex, and upon such terms as the Corporation shall, by vote, decide.

VII. PUBLICATIONS.

The Council shall cause to be prepared, or accept for publication, under the title of "The Memoirs of the Peabody Academy of Science," etc., original scientific papers, treatises or essays, with or without illustrations; preference being given therein to the labors and researches of the officers and students of the Academy, and of investigators of science in or relating to the county of Essex. And the said papers when presented by the Council, shall, after having been approved of by vote of the Corporation, be printed under the direction of the Council.

VIII. MEETINGS.

Meetings of the Corporation shall be held on the first Saturday in January, April, July and October. At least seven days' notice of every meeting shall be given by the Secretary. The meeting in January shall be the annual meeting, when the Treasurer, the Council, and the Executive Committee shall make their reports for the year preceding, and offer suggestions relative to the future management of the trust. Special meetings may be called by the Secretary, by order of the President, or, in his absence, the Vice President, or at the request in writing of any two members; but no appropriation of money shall be made at such meetings unless by an unanimous vote of the members of the Corporation present.

IX. APPROPRIATIONS.

Appropriations for the several objects of the Corporation shall be made for the ensuing year at each annual meeting; and the expenditures of the Executive Committee and any other committee or officer shall be strictly limited to the appropriations so made, except as hereinbefore provided.

X. RULES AND REGULATIONS.

All Rules and regulations made by the Council and approved by the Executive Committee, shall be binding until the next meeting of the Corporation, and, if approved at such meeting, shall have the force and effect of By-laws.

XI. BY-LAWS.

No Alteration shall be made in the By-laws except by an unanimous vote, unless at a regular meeting after a draft of the proposed alteration shall have been submitted to the members at a previous regular meeting.

XII. QUORUM.

AT ALL MEETINGS of the Corporation, five members shall constitute a quorum for the transaction of any business.

On motion of Mr. Peabody, the Board then proceeded to the election of officers, and the following were chosen:

WILLIAM C. ENDICOTT, *President.*

HENRY WHEATLAND, *Vice President.*

ABNER C. GOODELL, Jr., *Secretary.*

GEORGE PEABODY RUSSELL, *Treasurer.*

W. C. ENDICOTT, G. PEABODY RUSSELL, and S. ENDICOTT PEABODY, *Finance Committee.*

W. C. ENDICOTT, HENRY WHEATLAND, A. C. GOODELL, JR., JAMES R. NICHOLS, and HENRY C. PERKINS, *Executive Committee.*

FREDERIC W. PUTNAM, *Director of the Museum.*

Voted, — That ALPHEUS HYATT, ALPHEUS S. PACKARD, Jr., and EDWARD S. MORSE continue in their respective employment for the Academy, until the next meeting of this Board, at their present rate of compensation.

Voted,—To adjourn to Wednesday, September 16, at 3 P. M.

WEDNESDAY, SEPTEMBER 16, 1868.

The Board met this day, according to adjournment. Present—Messrs. Endicott, Marsh, Wheatland, Goodell, Peabody.

Voted, — That Alpheus Hyatt, Alpheus S. Packard, Jr., and Edward S. Morse, be hereby appointed Curators and elected members of the Council.

SATURDAY, OCTOBER 3, 1868.

Quarterly meeting this day. A quorum not being present, the meeting was adjourned to Saturday, October 10, at 11 A. M.

SATURDAY, OCTOBER 10, 1868.

The Board met according to adjournment. Present—Messrs. Endicott, Russell, Wheatland, Goodell, Nichols, Perkins, Peabody.

The President mentioned that the Council was organized on Friday, Oct. 2d, in conformity to the By-laws, and that Alpheus Hyatt had been elected its Secretary. The President then submitted for the approval of the Board the Rules and Regulations of the Council, as passed at a meeting held on Thursday, Oct. 8th, and certified to by its Secretary.

After several amendments, they were adopted as follows:

RULES AND REGULATIONS OF THE COUNCIL.

I. OFFICERS AND THEIR DUTIES.

THE PRESIDENT and VICE PRESIDENT of the Corporation shall be President and Vice President of the Council.

A SECRETARY shall be elected by the Council, and he shall record all its votes and doings in a book to be kept in the Academy, subject to the inspection of any member of the Council or of the Corporation. He shall notify members of the Council of all meetings, and shall make such communications to the Corporation and other parties, as voted by the Council.

THE DIRECTOR OF THE MUSEUM shall have special charge of the Museum and everything relating thereto, and shall see that the rules and regulations of the Council are properly carried out. He shall receive all letters, documents, books, and specimens sent to the Academy, and see that the same are acknowledged and given into the charge of the proper officers. He shall decide in all cases with regard to the arrangement, care, and use of the collections, not otherwise specially provided for, and his decision shall be binding unless overruled by the Council. In all cases when a department is left without a Curator, the Director shall act as Curator of the same until one is appointed. He shall act as Steward of the Council, and keep the accounts of all its expenditures and receipts. He shall have under his direct orders, such assistants, clerks, preparators and janitors as may be appointed, unless any such officer is specially assigned by the Council to some department, in which case he shall be under the orders of the Curator of that Department. At the Annual Meeting the Director shall render a report of the general work that has been done during the year, the condition of the museum, and such other matters as he may wish to bring before the Council.

THE CURATORS shall each be assigned by the Council to special departments, and shall have the entire charge of their departments, subject to the rules and votes of the Council and the general supervision of the Director. Each Curator shall receive from the Director all specimens and letters relating to his department, and shall have the specimens duly and properly cared for, labelled and arranged. He shall conduct the correspondence relating to his department, and as soon as possible after the reception of any specimens, he shall fill out and endorse a blank acknowledging the same, and, after obtaining the signature of the Director, forward it to the proper person. Each Curator shall keep a record of all additions and exchanges in his department, and report the same, with such other matters relating to his department as he may think advisable, to the Director, at least one week before the Annual Meeting, and at such other times as may be ordered by the Council.

II. THE MUSEUM.

The Museum shall be open to the public from 9 a. m., to 5 p. m., on *Wednesdays, Thursdays, Fridays and Saturdays*. On *Tuesdays* the Museum shall be open to Members of the East India Marine Society, and the Essex Institute, at the same hours. On *Mondays* the Museum shall be closed, unless by special vote of the Council. Children under twelve years of age will not be admitted unless in charge of a parent or guardian.

The Council shall assign to each Curator the amount of case-room to be occupied by his department, and shall determine upon a system of cataloguing, labelling, and arranging, which shall not be departed from, except provisionally, by the consent of the Director, until the next meeting of the Council.

III. USE OF THE COLLECTIONS.

Every facility, consistent with the welfare of the specimens, shall be granted by the Director and Curators to students and scientific persons for study and examination.

Specimens may be loaned, or sent for identification by the Curator in charge of the department, with the consent of the Director.

IV. DUPLICATE SPECIMENS.

The Curator of a department shall negotiate the exchange of duplicates in his department, but specimens shall not be distributed without the approval of the Director. The Director, however, may cause specimens of one department, acknowledged by its Curator to be duplicates, to be exchanged for the benefit of another department, and the Director may call on the Curators, from time to time, for a report on the duplicates in their departments and suggestions regarding their distribution.

V. ACKNOWLEDGMENTS OF SPECIMENS, BOOKS, ETC.

All specimens, books, pamphlets, etc., received at the Academy, of a nature to be arranged in its Museum or Library, shall be acknowledged and entered as a donation to the Academy, unless it is specially stated that they are intended as a donation to the Essex Institute, or to the East India Marine Society, in which case they shall be so acknowledged.

VI. STUDENTS.

Students will be received at the Academy for special instruction, on such terms as may be decided by the Council.

VII. MEETINGS.

Regular Meetings of the Council shall be held on the
Meetings shall be called by the Secretary by order of the
last Saturday of each month, at 7.30 p. m. Special
President, or at the request of three members in writing.
The regular meeting in December shall be the Annual Meeting.

At each regular meeting the Director shall present his accounts for approval before transmitting them to the Executive Committee of the Corporation.

Five members of the Council shall constitute a quorum.

VIII. ALTERATIONS AND AMENDMENTS.

ALTERATIONS or amendments to these Rules and Regulations shall only be made at a regular meeting, notice of the same having been given at the regular meeting preceding, and such alterations or amendments shall be submitted to the Corporation after the approval of the Executive Committee.

The council having reported for publication in the first number of the "Memoirs of the Peabody Academy of Science" a paper by Mr. Samuel H. Scudder, entitled "A Revision of the Large, Stylated, Fossorial Crickets;" the subject of receiving and printing the same was referred to Messrs. Nichols, Perkins and Goodell, with power to act.

The subject of opening the Museum to the public, was referred to the Executive Committee with authority to act.

On motion of Mr. Russell, a committee appointed by the chair, consisting of Messrs. Russell, Perkins and Peabody, was empowered to make a final arrangement with the Essex Institute, for the deposit of books, papers, pamphlets, historical specimens, etc., received by the Academy, and to report their action at a future meeting.

The subject of retaining the services of Mr. Edwin Bicknell, as preparator for the Museum, was referred to the Executive Committee with authority to act.

The By-Laws, adopted at the meeting of the Board held Sept. 12th, was then amended by an unanimous vote as follows:—The words "Special lectures, and lectures to classes, may be given, subject only to such terms and regulations as the Council may determine," were added to article VI. Adjourned.

SATURDAY, JANUARY 2, 1869.

Annual meeting, this day. Present,—Messrs. Endicott, Russell, Marsh, Wheatland, Goodell.

The Annual Report of the Council was presented and accepted.

Adjourned to Tuesday, Jan. 26th.

TUESDAY, JANUARY 26.

Adjourned Annual meeting. Present,—Messrs. Endicott, Wheatland, Goodell, Nichols, Peabody.

The reports of the Treasurer and Executive Committee were presented and accepted.

Voted,—That the subject of printing the several reports be referred to Messrs. Endicott, Wheatland and Goodell, with authority to act.

The following officers were elected for the year ensuing, and until others are chosen in their stead.

WILLIAM C. ENDICOTT, *President*.

HENRY WHEATLAND, *Vice President*.

ABNER C. GOODELL, JR., *Secretary*.

GEORGE PEABODY RUSSELL, *Treasurer*.

W. C. ENDICOTT, G. PEABODY RUSSELL and S. ENDICOTT PEABODY, *Finance Committee*.

W. C. ENDICOTT, HENRY WHEATLAND, A. C. GOODELL, JR., J. R. NICHOLS and H. C. PERKINS, *Executive Committee*.

Voted,—That Edwin Bicknell be appointed Preparator, and Caleb Cooke, Assistant.

After determining the appropriations for the year, and the transaction of other business, adjourned.

REPORT OF THE COUNCIL.

TO THE TRUSTEES OF THE PEABODY ACADEMY OF SCIENCE:

GENTLEMEN: In accordance with the vote of the Council, I have the honor to transmit, for your approval and consideration, the accompanying documents as the Annual Report of the Council.

Respectfully,

A. HYATT, *Secretary.*

Salem, January 2, 1869.

ABSTRACT FROM THE RECORDS.

The Secretary has the honor to report that the Council have held two regular and four special meetings.

The Council was partially organized at the special meeting of Oct. 2d, 1868, the President of the Corporation in the chair, by the appointment of the Curators to their various departments, and the election of a permanent Secretary. At the same meeting the first draft of the "Rules and Regulations" was read and ordered to be printed for the use of the members.

At the special meeting, Oct. 8, 1868, the printed draft was read, and after considerable discussion, resulting in the alteration of some paragraphs, was adopted and ordered to be sent to the Trustees for their approval. In these "Rules and Regulations" it was provided that the President and Vice President of the Corporation should be President and Vice President of the Council.

The Director was authorized to print blanks for the acknowledgment of donations to the Academy, to procure blank books for entering the collections received, and to print three hundred copies of Dr. Packard's "Directions for Collecting Insects."

Mr. Scudder's paper on the "Stylated Fossorial Crickets" was accepted for publication in the Memoirs, and ordered to be sent to the Trustees for approval.

The Trustees were requested to make some arrangement for depositing historical relics and coins with the Essex Institute; and to consider the appointment of a preparator.

The first regular meeting, Oct. 31st, 1868. Announced, that the printing of the first number of the Memoirs was provided for by an agreement between a committee of the Trustees and the Director and Curators of the Museum.

Voted, — "That in labelling the collections all nouns used as specific names, and specific names when derived from proper names shall be written with capital initial letters, and, also, that the same rule shall obtain in the official publications of the Academy." It was, also, further voted, "that in labelling the collections the name of the person who first united the generic and specific appellations shall be given as the authority for the name, and that when the name of the original describer of the species is given, it shall be in parenthesis."

A vote of thanks was passed to the Panama Railroad Company, and to the Pacific Mail Steamship Company, for their free transportation of packages of the Academy.

The amendments of the Trustees to the "Rules and Regulations" were accepted without debate.

Special meeting, Nov. 19th, 1868. The request of the Consolidated High School of Newburyport for a course of lectures was granted, and Dr. Wheatland was appointed to make the necessary arrangements.

Regular meeting, Nov. 31st. No business transacted.

Regular meeting, Dec. 26th, 1868. The annual report of the Director was read, and with it a plan of operations drawn up by the Director and Curators. Dr. Wheatland announced that arrangements had been made for the lectures at Newburyport and that two of them had been delivered.

Special meeting, Dec. 28th, 1868. An Abstract from the Records of the Proceedings of the Council was read and with the Director's Report accepted by the Council. The Plan of Operations from the Director and Curators, was again read, accepted, and ordered to be transmitted to the Trustees. These various reports were then accepted in a body and ordered to be transmitted to the Trustees as the Annual Report of the Council.

REPORT OF THE DIRECTOR OF THE MUSEUM.

GENTLEMEN OF THE COUNCIL:

During the month of March, 1867, the East India Marine Hall was purchased by the Trustees of the Peabody Fund for the Promotion of Science in the County of Essex. On the sixth day of April following the Trustees received from the East India Marine Society its large and unique Museum as a permanent deposit; and with that day the history and operations of the Museum of the Academy commenced.

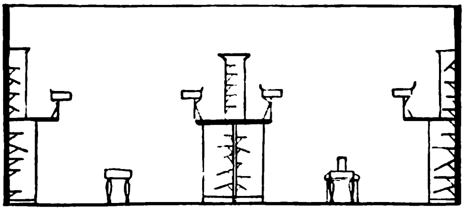
On the 16th of April, by vote of the Trustees, the Hall was opened free to all visitors for about two weeks. This act of the Trustees was fully appreciated by the public, and several hundred persons daily availed themselves of the privilege of visiting the East India Marine Museum, without special permit or introduction. With these public days closed the individual record of the oldest Museum of the State.

On the 29th of May following, the Scientific Collections of the Essex Institute were added to the Museum as a permanent deposit.

Thus through the munificence of the founder of the Academy, an unique, and, in several respects, one of the most valuable Museums in the country, will soon be opened for the instruction of the public; and we can but feel grateful for the action, and universally expressed good-will of the many parties who have contributed to bring about the permanent union of two such valuable Museums.

THE HALL.

On the 1st of May, 1867, I had the honor of receiving from the late President of the Trustees, authority to proceed with the work of taking down and packing away the collections of the East India Marine Museum, and of having plans made for the alterations of the hall, the erection of cases, etc. At the meeting of the Trustees on May 16th, the action of the President was confirmed and I was fully authorized to proceed with the work, and employ all necessary assistants. Accordingly Dr. A. S. Packard, Messrs. Alpheus Hyatt, E. S. Morse and Caleb Cooke, all Curators in the Natural History department of the Essex Institute, were appointed assistants, and the services of Capt. Thomas Saul, for many years the Custodian of the East Indian Marine Museum, and of Capt. Joseph Hammond, a member of the Society, were secured. The work of preserving the labels and packing the specimens in boxes so that they would not be injured during the remodelling of the hall, was a laborious task; but, thanks to the gentlemen employed, it was done more expeditiously than was thought possible, and with perfect safety to the specimens.


TRANSVERSE SECTION OF HALL.

While the dismantling was going on, Mr. Morse was engaged in making plans for the new cases, and the proposed alterations in the hall. The primary object was to provide as much case room as possible. This has been most successfully attained, and though the hall, as now finished, has no pretentions to artistic merit, the care taken by Mr. Morse to make every foot of space available, and the lightness and simplicity of construction, is in harmony with the purposes for which the room is to be used. The cases and galleries are in every respect suitable and far more desirable than any architectural effect which might have been derived from the occupation of valuable space with cornices and pilasters.

The bracket supports* for the shelves, perfected by Mr. Morse, after repeated experiments, are considered the most perfect shelf holder

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*Since these brackets have been used in our cases, Mr. Morse has adopted them for use in Libraries and similar places; and at the solicitation of, and in connection with Mr. Aaron Goldthwait, Jr., has taken out patents for the several patterns.

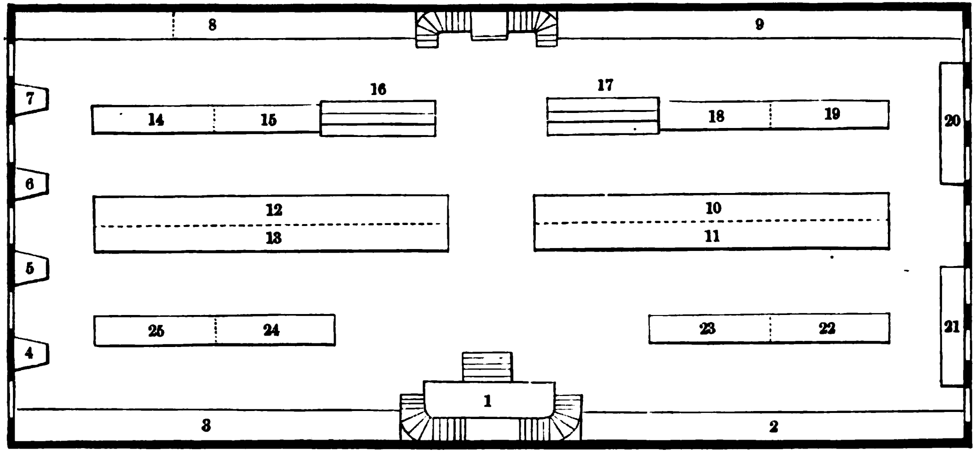

DIAGRAM OF FLOOR OF HALL.

1. Large case over entrance stairway, contains a number of life size clay models of the several castes of natives of India, and a large number of smaller models of a similar character; 2. Wall cases, portion of the Ethnological collection relating to costumes and burial; 3. Wall cases, portion of the Ethnological collection relating to the Arts, Manufactures, Domestic and Musical Implements and Pipes; 4-5. Alcove cases, Idols; 6-7. Alcove cases, portion of the Osteological collection; 8. Wall cases, a portion of the Osteological collection and the stuffed specimens of Fishes and Reptiles; 9. Wall cases, Palæontological collection; 10-11. Large central case, Sponges, Corals and Echinoderms; 12-13. Large central case, mounted skins of Birds and Mammals; 14-15. Table cases, Shells; 16-17. Upright cases intended for the Alcoholic Mollusks above, and the large shells below, but 16 is temporarily used for Bird's nests and Eggs, and 17 for Fossils; 18-25. Table cases, Shells.

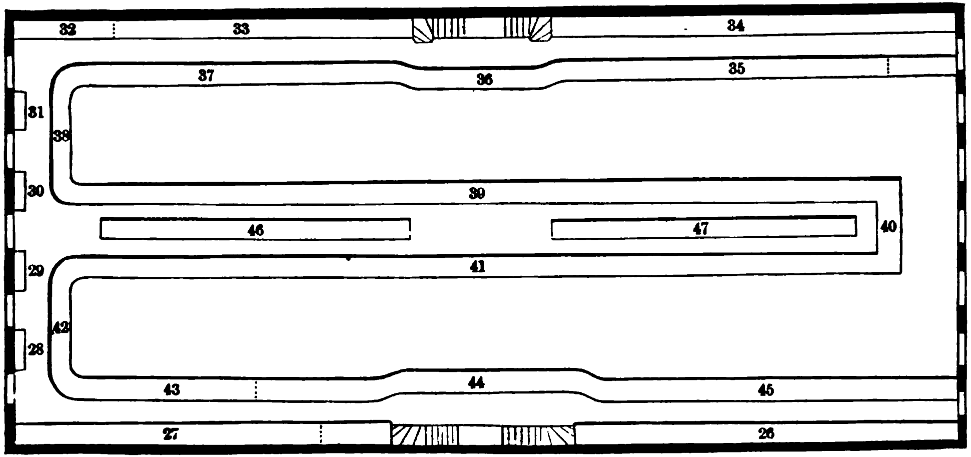

DIAGRAM OF GALLERY OF HALL.

26. Wall cases, contain Implements of War, etc.; 27. Wall cases, Implements of War, etc., and models of Boats and Ships, and of various kinds of Paddles. The space above the cases in this section of the Gallery is given to the exhibition of large Boats and other means of transportation; 28–31. Wall cases between windows, Botanical specimens; 32–37. All the cases on this Gallery are devoted to the Essex County Collection. The space over the wall cases on this Gallery is occupied by large stuffed specimens of County Fishes; 38–43. Railing cases, Entomological Collection; 44–45. Railing cases, Achæological Collection, principally consisting of Stone Implements; 46. Upright case, Alcoholic Fishes; 47. Upright cases, Alcoholic Insects and other Articulates. On top of these central upright cases will be placed the large stuffed specimens of the Sawfish and Shark, now in course of preparation. On the Iron railing of the Gallery are arranged, on the Zoölogical side a large number of Horns of various animals, and on the Ethnological side all the Spears, etc., that were too long to go into the cases, also a number of Pictures of Ethnological interest. Over the entrance to the Hall and projecting from the railing, are full rigged and large models of three ships of early construction.

now used in Museums, combining easy adjustment with perfect safety and economy of space. They have also the great advantage of supporting the shelves wholly from the back, and most solid portion of the case, and consequently the unsightly transverse bars of the ordinary ratchet style are avoided. The skill and inventive genius of Mr. Morse have also been most advantageously used in relation to the locks and catches.

The arrangement of the cases in the hall and the preliminary grouping of the specimens, can best be understood by consulting the preceding cuts.

WHAT HAS BEEN ACCOMPLISHED.

While the alterations in the hall, the construction of the cases, and similar mechanical matters were progressing, all the active operations of a large and rapidly increasing Museum were being conducted by the officers in charge, to an extent which guarantees for the future of the Academy, an activity and sphere of usefulness far beyond what its present means will allow.

In the meantime the collections of the Essex Institute were brought from Plummer Hall, and the arrangement of the dry specimens was commenced. This work was carried on with all possible dispatch, and the specimens were placed in the cases as soon as they were ready for their reception. Thus the Ethnological, Archæological, Palæontological and Anatomical collections were quickly in their respective places, and the stuffed birds, mammals, fishes and reptiles soon followed. The sponges, corals, echinoderms and crustaceans were next arranged. During this time, the preliminary arrangement of the large collection of shells, and the classification and arrangement in boxes of the collections of pinned insects, were commenced. The amount of work in these two departments will require some time to perfect their final arrangement.

The necessity of first looking after the dry and mounted specimens, prevented, until quite recently, our attention being given to those preserved in alcohol. These last were in great part in their proper bottles before removal from the Essex Institute, so that their arrangement in the cases can readily be accomplished during the present winter, and in the spring the public can be admitted to the Museum.

The duties of the persons employed in the various departments have been assigned as follows:

Messrs. Hyatt, Packard and Cooke, assisted by Capts. Hammond and Saul, took charge of the Ethnological collection; Mr. Cooke and myself the Archæological collection; Messrs. Cooke, Hyatt and myself, the Anatomical, and the mounted specimens of Mammals, Reptiles and Fishes. Mr. Hyatt the Palæontological specimens; Mr. Cooke and myself, the Sponges, Corals, Echinoderms, etc., and the mounted Birds.

In this last department Mr. C. A. Walker rendered voluntary assistance for several days, and he has mounted a number of skins and otherwise given to the Academy the advantage of his experience in Taxidermy. Dr. Packard has had charge of the large collection of Insects, and other Articulates.

The large collection of Shells has been under the sole care of Mr. Morse, and the plan which he has adopted, of mounting the specimens on black tablets of wood, has so many advantages for several other classes of specimens that it will be used whenever applicable in the general arrangement. A large part of Mr. Morse's time having been devoted to other duties the desired progress has not been made in the arrangement of the shells. He has, however, secured for the Academy most of the type specimens from which the drawings were made by him while working for the State upon the new edition of Gould's Invertebrata of Massachusetts, and this more than compensates for the time that would otherwise have been bestowed on the Academy's collection.

The valuable Herbarium belonging to the Institute collection has been carefully reviewed by Mr. C. M. Tracy, and all the pressed specimens from the county have been remounted on white paper, in conformity with the mode adopted by Prof. Gray in his Herbarium. The sections of wood, specimens of fruit, seeds, etc., have been placed in the gallery cases at the end of the hall. The pressed plants have not yet been taken from the rooms of the Institute, there being only sufficient space to accommodate the county specimens.

Capts. Hammond and Saul were first engaged to attend in the hall during the days it was open to the public, before being closed for reconstruction, and afterwards were called upon, from time to time, to assist in the general work.

Mr. W. S. West has been acting as Clerk to the Director. The faithfulness and willingness with which he has performed the various and oftentimes most arduous duties, and the reliance which all the officers have placed in him, render his services of the utmost importance to the Academy. I must in justice state that his assistance, in the performance of many business transactions, has enabled me to give more attention to the direct arrangement of the Museum, and other scientific operations of the Academy, than would otherwise have been possible.

Mr. Caleb Cooke has from the first been acting as general Assistant to the Director, and has had manifold duties to perform. Besides his assistance in the arrangement of the Museum, he has been entrusted with the reception and entry of the almost daily invoices of specimens; the charge of the expressage; the care of the alcoholic specimens, and materials for the arrangement of the collections; the preparation of skeletons, etc.

Mr. Edwin Bicknell has been called upon, from time to time, for assistance in the preparation of various specimens, but it was only at the last meeting of the Trustees that his official appointment was decided upon, and it is a matter of congratulation that, from this period, one third of his valuable time will be devoted to the work of the Academy. This appointment will be most beneficial to the Museum, as Mr. Bicknell's rare skill in manipulation will greatly add to the value and efficiency of the collections.

DEPARTMENTS.

The present division of the Museum into departments, under charge of Curators,* is as follows:

1. *Geology and Palæontology.* Mr. Hyatt, Curator. This collection consists principally of Fossils received from the Essex Institute, and a valuable collection made by the Curator in the Silurian and Devonian formations of New York State.

2. *Mineralogy.* No Curator appointed. With the exception of the minerals of Essex County, arranged in the cases devoted to the County collection by Mr. Hyatt, the want of case room has prevented the exhibition of the specimens of this department, and they have been placed in trays and stored in the basement until some provision for their accommodation is made.

3. *Botany.* No Curator appointed. As previously stated this department is being put in order by Mr. Tracy. Owing to the want of case room, only a small portion is arranged in the Museum.

4. *Protozoa.* No Curator appointed. This collection has been arranged in a portion of the northern central case, and consists chiefly of a fine collection of Sponges.

5. *Radiates.* Mr. Morse, Curator. This department is quite rich in Corals and Echinoderms. The preliminary arrangement has been made, principally by Mr. Cooke, in the northern central case. The specimens have nearly all been identified in former years, by Prof. Verrill and Mr. A. Agassiz. A small amount of labor on the part of the Curator will complete the final arrangement.

6. *Mollusks.* Mr. Morse, Curator. This large collection will require much labor before its arrangement is completed, and it is much to be regretted that only one half of the Curator's time is secured to the Academy.

7. *Articulates.* Dr. Packard, Curator. The Museum is quite rich in several groups of Insects, and the classes of Worms and Crustaceans are well represented. The arrangement of the specimens is progressing well, and they are in great part on exhibition. Mr. Cooke

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* The By-laws require the Director to act as Curator of all departments to which Curator is not specially appointed.

has for some time past lost no opportunity of securing specimens of Parasites from the various animals that have come into his hands, and by his efforts a large and interesting addition of Parasites has been made to this department.

8. *Vertebrates.* No Curator appointed. This department embraces a good collection of skulls, several skeletons of Mammals, Birds, Reptiles and Fishes; and a fair representation of the various classes by mounted and alcoholic specimens, including most of the species indigenous to the County. With the exception of the alcoholic specimens of the Reptiles and Fishes, the preliminary arrangement of the collection has been made, though the cases allotted to the department are by far too few in number to permit a proper classification, especially in the Osteological collection, where the skulls are so crowded as to prevent a systematic arrangement of the groups.

9. *Archæology.* No Curator appointed. Special attention has been given to collecting specimens in this department, and excursions have been made to the "shell-heaps" in our County, and in Maine, by the officers of the Academy, which have resulted in securing many valuable and interesting bone implements, and the formation of a collection of bones of the various animals used as food by the creators of the shell heaps. This collection of bones, all of which have been identified by Prof. Wyman, also bears on the former Zoölogy of our County, and exhibits the fact that several animals now no longer found within our limits were formerly abundant,—such are the bear, deer, wolf, racoon and beaver, among the mammalia, and the great auk (Alca impennis) and wild turkey, among the birds. The great auk being now extinct.

In addition to the important specimens obtained by our own examinations, the department contains a large collection of the stone implements found in New England, and many from other places; also a rich collection of ancient Peruvian vessels, and several unique and interesting implements from various localities. The specimens of this department are nearly all catalogued, and arranged in the railing cases of the eastern gallery, with the exception of the Peruvian vessels and a few of the larger specimens, which have, for the present, been placed among the domestic implements in the sister department of Ethnology.

10. *Ethnology.* Mr. Hyatt, Curator. This collection, comprising the principle part of the Museum of the East India Marine Society, as well as a very interesting portion of the Institute collections, is especially rich in the native implements of the Pacific Islands, and in specimens exhibiting the costumes of the inhabitants of various countries. When fully arranged it will form the most attractive portion of the Museum to general visitors, and its size has required that about one

quarter of all the case room in the hall should be devoted to it, though even with this liberal allowance many of the cases are so crowded as to prevent the proper display of all the specimens.

For farther and more detailed accounts of several departments, I refer to the annexed reports of the Curators.

THE ESSEX COUNTY COLLECTION.

From the organization of the Essex County Natural History Society, afterwards merged into the Essex Institute, the officers in charge have been engaged in securing as perfect a collection as possible, illustrative of the Geology, Mineralogy, Flora and Fauna of Essex County; and fifteen years ago I commenced forming for the Institute, a collection of the birds of the County, and in connection with Mr. S. Jillson, published the results of our observations in the Proceedings of the Essex Institute for 1856, in the form of a Catalogue of the Birds of Essex County, with a few notes relating to the time of appearance of various species and their comparative abundance. In this list 245 species found in the County are enumerated. In a List of the Birds of New England, just published by Dr. Coues, in the 5th vol. of the Proceedings of the Institute, about 400 species are stated as occurring in New England. Of these, we have already in our County collection, 189 species actually taken within the limits of the County, so that by the addition of about sixty species and 200 specimens, we should probably have represented a full series of the County birds in the various states of plumage, and illustrating both sexes and the young. We also have the nests and eggs of many of the species. I mention this collection in detail, as it is a fair sample of the representation of the other classes of the animal kingdom in the County collection, and exhibits the progress that has been made toward the illustration of our own fauna. In regard to the flora and mineralogy of the County, the collection is equally good, and with the constant attention of the officers of the Academy to this department of the Museum, we hope ere long to make it the most complete local collection in the country.

The western gallery is given entirely to the County collection; and when the specimens shall be arranged, properly labelled and catalogued, it will present the most ready means that can be devised of becoming acquainted with the animals plants, and minerals of our immediate locality. The only regret is the limited space devoted to this important collection.

ADDITIONS TO THE MUSEUM.

In addition to the large number of specimens received from time to time from the Essex Institute, in accordance with the agreement with that Society, one hundred and forty donors have made two hundred and five donations directly to the Academy. For a general notice of which I refer to the annexed report by Mr. Cooke.

From the first days of the existence of the Museum, Dr. Wheatland expressed a desire to secure the portraits of the prominent merchants of Salem engaged in the East India trade, and also of those persons who have been intimately connected with the East India Marine Society, as a fitting accompaniment to our hall. His efforts have been thus far successful, and portraits of the following persons have quite recently been received: William Gray, Nathaniel Silsbee, Pickering Dodge, Dudley L. Pickman, Stephen C. Phillips, Joseph Orne, Allen Putnam, and Benjamin Carpenter; thus forming, with the portraits of Nathaniel Bowditch, E. Hasket Derby and Joseph Peabody, previously in the Museum of the East India Marine Society, a good foundation for a portrait gallery of the representative men in this department of our history. Many other portraits, several having already been promised, will undoubtedly be contributed when the desire of the Trustees to form such a gallery is generally known.

EXCHANGES.

Many valuable specimens have been tendered to the Academy in the form of exchanges, but little can be done towards availing ourselves of these offers until the preliminary arrangement of the Museum is made. Large and important collections will eventually be received in exchange for our duplicates.

THE HISTORICAL SPECIMENS.

The Museum of the East India Marine Society contained a number of articles that were simply curiosities, or wholly of an historical character. As this class of specimens could not be brought into the general arrangement without seriously affecting the character of a Museum intended to be purely of a scientific nature, and as the Essex Institute has a large collection of similar articles in its Museum, most of the specimens of the character stated have been temporarily deposited in Plummer Hall. There still remain, however, stored at the Academy, several articles to which I shall call the attention of the Council at an early day, their intrinsic and historical value being such that I do not think their disposition should be left entirely to the option of the Director. No disposition has yet been made of the large collection of coins and medals received with the Museum of the East India Marine Society.

The coins have been partially arranged by Mr. John Robinson, and carefully done up in papers according to countries and dates.

STUDENTS.

Mr. Charles A. Walker of Chelsea entered the Academy as a special student in September last, but no regular course of instruction has yet been adopted by the Council.

LECTURES.

The first course of lectures given by the Academy is now being delivered at the request of the School Committee of Newburyport, before the consolidated High Schools of that city. The first lecture was delivered by Mr. Hyatt, Dec. 15th, on Geology; the second by Mr. Tracy, on Botany; the third by Mr. Morse, on the Invertebrates; and the fourth, the last of the course, to be on the Vertebrates, has been allotted to myself, for the fifth of January.

MR. M'NIEL'S EXPEDITION TO CENTRAL AMERICA.

In May last Mr. J. A. McNiel started on an expedition to Central America, under the direction and immediate auspices of the Academy, with the agreement that a full series of all the specimens collected should become the property of the Academy. After collecting in the field for about five months, and expending all his funds, Mr. McNiel availed himself of the liberality of the Panama Railroad Company and Pacific Mail Steamship Company, to return with his collection, free of cost, in order to arrange for the continuance of the expedition and he is now ready to return to the field as soon as the necessary funds can be secured. Mr. John Cummings of Woburn has, with his usual liberality, given two hundred dollars to the Academy to be used in the prosecution of the expedition.

We are highly gratified that the operations of the Academy are appreciated by others, and our thanks are especially due to the President and officers of the Pacific Mail Steamship, and Panama Railroad Companies, who have in the most liberal and cordial manner, extended free passes to Mr. McNiel, and free transportation of the materials and specimens of the expedition over their routes, thus greatly increasing the resources of the expedition.

The cordial reception which the Academy's letters of introduction secured for Mr. McNiel in Central America is also most gratifying. I take this opportunity of tendering our thanks to Wm. Nelson, Esq., of Panama, Capt. Douglas of the Panama Railroad Company's Steamship Guatemala, and to all resident officers of the company who have assisted Mr. McNiel, and to the Messrs. De Shon, and Don Ycaza, and other friends in Nicaragua, for the hospitality extended to him.

I append a brief report by Mr. McNiel relating to the expedition, which, if continued, will undoubtedly result in collecting much important Zoölogical and Archæological information of that country.

THE AMERICAN NATURALIST.

At the close of the year 1866, the feasibility of establishing a Monthly Magazine of Natural History, which should combine with scientific accuracy a popular and interesting rendering of the topics discussed, and the consequent bridging over of a wide gap in the literature of our country, was decided upon as a private enterprise by the four editors of the Magazine.

After carefully considered plans the first number was issued in March, 1867, under the auspices of the Essex Institute, and has been continued monthly from that time. All the numbers of the magazine have been noticed and supported in the most cordial manner by the press, and by the scientists and educators of our country, and it has received several notices of praise from European magazines, and distinguished Naturalists. Nor have the people been backward in coming to its support, for, thanks to the cordial notices of the press and the exchange advertisements, the Magazine has now a regular circulation of 2400 copies monthly, and from the first the subscribers have increased with every number issued. Thus, without any capital, and with only their own efforts and the good will of the Trustees of the Academy, the editors have been able to conduct this important missionary work in science for a period of two years.

Owing to the appointment of the editors as officers of the Academy, and the assistance which the magazine received from the Trustees, the *Naturalist* has been issued under the imprint of the Academy, since the commencement of the second volume. The Academy would derive many advantages from the entire possession of the magazine, independent of the reputation which it has already received from its publication.

MEMOIRS OF THE ACADEMY, AND FORMATION OF A LIBRARY.

Beyond a local influence and reputation derived from its museum, meetings and lectures, no institution has taken a high rank without a regular publication by which its scientific position can be judged. Feeling this fact most keenly, and knowing that the Academy in accepting the charge of the scientific collections of the Essex Institute, also assumed the maintenance of the honorable scientific character which the Institute had acquired, several officers of the Academy, from the first, urged the necessity of a regular scientific publication, and at the last meeting of the Corporation arrangements were made to provide for the issue of the first number of the *Memoirs*. This essay is now going through the press, under the charge of the editors of the *Naturalist*, and is entitled, "A Revision of the Large Stylated Fossorial Crickets," by Mr. S. H. Scudder, illustrated with a full size steel plate.

The great advantages which the Academy will receive from the publication of this *Memoir* will, I trust, induce the Corporation to devise means for a regular publication, and thus afford the officers an opportunity of publishing the results of their labors and investigations, and of maintaining an interchange of thought with other minds.

The books received in exchange for the *Memoirs* would form a basis for a valuable library of reference, which is an essential accompaniment to an institution of this character.

In this connection it is proper to state that a number of books were received with the Museum of the East India Marine Society. Of these, the scientific works have been placed in the Director's room, and the others, including the volumes of Manuscript journals, have been, for the present, deposited in Plummer Hall.

F. W. PUTNAM,
Director of the Museum.

REPORT OF THE CURATOR OF ARTICULATA.

The Worms and Crustaceans, and a large portion of the Insects, have been placed on exhibition.

Among the Worms, besides a number of native marine species, and a valuable collection of intestinal worms, identified by Dr. Weinland, is quite a full suite of the species of Northern Europe and Greenland, received from the Royal Museum at Copenhagen, duly labelled, and valuable as type specimens.

The collection of Crustacea is an important one, and through the assistance of Dr. H. A. Hagen, of the Museum of Comparative Zoölogy at Cambridge, and Mr. S. I. Smith, assistant in the Museum of Yale College, will be greatly increased in value. Dr. Hagen has identified the Fresh-water Crawfish (Astaci) and found some interesting forms among them. Mr. Smith is identifying the Crabs (Cancroids and Grapsoids), and has returned the dry specimens sent him for study, and will soon commence on the alcoholic specimens. Among the smaller forms are several types of species described by the Curator from Labrador, and a very full series of Scandinavian and Arctic species, as well as several Central American forms received from Mr. McNeil, together with a number of Crabs from Africa, the East Indies and China.

The collection of Insects is a large and most important one. It comprises, besides a large number of Brazilian, Central American and African species, valuable, and in many points, interesting collections from Europe, the Arctic regions, Labrador and this country, together with an unusually large collection of larvæ and pupæ, as well as adult forms in alcohol, many of which have been obtained during the year past through the agency of the *American Naturalist*.

The Hymenoptera have been arranged in boxes and placed in the railing cases. Among them are a collection of English bees and wasps, labelled by Mr. Frederic Smith, of the British Museum, and a collection of bees and wasps from Dr. Gideon Lincecum, of Long Point, Texas. Mr. Nǒrton has very generously contributed a selection of the species of Wasps and Saw-flies from his cabinet, and materially aided the Curator in the identification of other specimens. The Academy has also obtained a valuable collection of Hymenoptera, from the Smithsonian Expedition to South America, chiefly made at Quito and the head-waters of the Amazon. The Curator has named the Bees and Wasps, while Mr. Edward Norton has worked up the Ants, and the collection has, by the liberality of the Smithsonian Expedition, been added to the Museum of the Academy, the number of duplicates that were to be returned having been too few to separate from the main collection. A list, with descriptions of the new species discovered by the expedition, is appended to this report.

The collection of Lepidoptera has been arranged with the exception of the smaller moths, of which the Tortricidæ and Tineidæ have been sent to Mr. C. T. Robinson of New York for study. The butterflies take up the largest part of the case room, and have been mostly named by Mr. Tryon Reakirt of Philadelphia. The collection of European Micro-lepidoptera is very extensive and valuable, having been named by Prof. P. C. Zeller of Meseritz, Prussia. It is too valuable to be placed on exhibition and is kept in a lower room.

The Curator is now engaged on a preliminary arrangement of the Diptera, of which the Museum possesses a series of Tipulidæ and other genera named by Baron R. Osten Sacken, the Russian Consul General at New York, together with a small collection named by Mr. E. T. Cresson, the Curator of the American Entomological Society at Philadelphia.

The Coleoptera are not yet arranged. The collection of this group is very large and rapidly increasing. It contains type specimens named by Dr. J. L. Leconte, Henry Ulke, Esq., and Dr. G. H. Horn, and a remarkably fine collection of Brazilian beetles, which Mr. G. D. Smith of Boston, who possesses the largest collection of exotic beetles in the country, authentically labelled by the leading French and German entomologists, is now naming. This is a long and tedious work, and the Academy is under special obligations to Mr. Smith, not only for this assistance, but for a very liberal donation of beetles from various states in the Union, west of the Rocky Mountains, amounting to over 1500 specimens, many of great rarity and all designed to fill existing vacancies in the Museum. A part of these are already named, a few are undescribed, and the remainder are yet to be identified by their liberal donor at an early day. The Coleoptera of Central America have a fair representation in the Museum, a number having been added through the McNiel Expedition. Mr. F. G. Sanborn of Boston, has also aided me in naming the beetles, from the comparison of types in his own collection and that of the Boston Society of Natural History. The collection of alcoholic larvæ has been largely increased by specimens received from Dr. H. Shimer, Mr. Sanborn, and the Curator.

The Hemiptera, though not yet placed on exhibition, are very well represented in the Museum, and the entire collection has been named by Mr. P. R. Uhler, Librarian of the Peabody Institute at Baltimore. It embraces species from the East Indies and Brazil, as well as a good representation of our native species. The Hemiptera collected in Nicaragua by Mr. McNiel, together with a much larger number of species from Guatemala, are still in Mr. Uhler's hands for determination.

The Orthoptera are displayed in the railing cases, and contain many rarities from Brazil and Central America, the latter collected by Mr. McNiel. The Crickets (Achetidæ) are in the hands of Mr. S. H. Scudder, Custodian of the Boston Society of Natural History, for study and identification. The alcoholic collection of this group is also rapidly increasing.

The Neuroptera are not arranged. The collection of this suborder is not large, however, and will probably be arranged before this report is printed. The Academy is indebted to Dr. H. A. Hagen, for naming a number of Labrador and New England species, thus very materially adding to the value of the collection.

The Arachnids have been arranged on the shelves by Mr. J. H. Emerton. This is a large and valuable collection, and besides the collection of New England species, made for a number of years by Mr. Emerton, embraces a series of types of the Harvest men (Phalangidæ) illustrating a paper by Dr. H. C. Wood, jr., printed recently in the Proceedings of the Essex Institute, and a good number of exotic species. A few species of Chelifers, or False Scorpions, have been identified by Dr. Hagen.

For the arrangement of the Myriapods the Academy is also indebted to Mr. Emerton. This collection also contains a number of species named by Dr. Wood, who has published a work on the Myriapoda of North America.

The final arrangement of the Articulata has been greatly perfected by the addition of so many typical specimens from the hands of our most eminent entomologists.

The work of displaying the remainder of the insects will go on more rapidly than heretofore, when so much time was necessarily expended in numbering, sorting and packing specimens to be sent away to specialists. In this work the Curator has been greatly aided by Mr. Charles A. Walker, who has always evinced the greatest readiness and skill in mounting specimens for exhibition.

Through the last summer, collections were made to form a department of Economical Entomology, in order that the practical bearings of the science be fully illustrated. It is believed that even with the material already on hand, the section of applied entomology will, when arranged, be of great popular interest. It is designed to follow the arrangement adopted by the Paris Universal Exposition of 1867, and will contain: — 1st, specimens of Insects which produce Silk, Wax, Honey and Dyes, the Edible Insects, and Insects employed in Medicine; 2d, the Injurious Insects, including those which attack the cereals, garden vegetables, forage and ornamental plants, fruit and forest trees, and woods employed in buildings, books, furs, feathers, woolens, &c; 3d, the parasites of man and other animals: the collection to be supplemented by a typical series of beneficial insects, *i. e.* such as prey on the injurious species.

Our object in arranging the entomological portion of the Museum will be, — 1st, to place on exhibition a general collection, embracing the typical genera and species; to be accompanied with dissections arranged on cards, with the various parts of the animal distinctly named; for instance, dissections of a Centipede, a Spider and a Bee, to illustrate at a glance the characters of the three orders of the class of insects, together with microscopic preparations to illustrate the anatomy of the internal organs and of the tissues; 2d, a separate collection of the Articulates of Essex County, and 3d, the department of applied entomology. The same plan will be carried out in the arrangement of the Worms and Crustacea.

We have thus sketched out the work of the future and shown what must be done before the arrangement of one portion of the Museum can be considered as complete.

DONATIONS.*

W. E. Johnson, Lithodes arctica, from Mass. Bay. W. W. Denslow, Xylocopæ and their cells in wood. E. Norton, seventy-seven specimens of Wasps. E. S. Wheeler, insects from Savannah. H. C. Davis, insects from McGregor, Ill. F. W. Putnam, a large number of Limulus Polyphemus, from Rowley river. Mrs. A. Stone, Epēira and larvæ of insects from Providence, R. I. S. Carlton, Mygale from Salem.

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*Many of the donations were received through the medium of the *Naturalist*.

H. F. Shepard, insects from Grafton, N. H. F. G. Sanborn, Lithosia casta Sanborn, from New York; Spiders from the White Mountains. W. H. Burnham, two specimens of Pimpla from Essex. G. D. Smith, 1500 specimens of Coleoptera from North and Central America. J. H. Sears, insects from Danvers. W. S. West, Spider from Salem. Dr. H. Shimer, insects from Illinois. C. V. Riley, insects from the West. Charles Walker, insects from Chelsea. E. Burgess, Gall-flies and other parasites and moths from Beverly. F. C. Clough, Diapheromera or "Walking Stick," from Warren, N. H. B. H. Silsbee, Beetles from Rio Janeiro. R. E. C. Stearns, Crabs from Monterey, Cal. C. Cooke, Cicada from Salem. A. S. Packard, jr., Injurious Insects, &c., from Salem. Capt. Charles H. Fabens, part of an Ants' nest from Cayenne. E. S. Morse, collection of insects from Salem. Miss Edith Morse, insects from Salem. J. W. Roberts, Longicorn beetle from Salem. E. Bicknell, Galls from the Hickory. C. K. Stevens and ——— Chamberlain, Crabs, &c., from Mass. Bay. S. Q. Felt, specimens of shellac on a twig from India. Dr. G. A. Perkins, seven specimens of the Fire Fly from Cuba. J. H. Emerton, collection of insects from Salem.

A. S. Packard, Jr.,
Curator.

APPENDIX TO THE REPORT ON ARTICULATES.

List of Hymenopterous and Lepidopterous Insects collected by the Smithsonian Expedition to South America, under Prof. James Orton. By A. S. Packard, Jr.

The collection of Hymenoptera and Lepidoptera of which a list is here given, was made by the Smithsonian Expedition to South America, in 1867. The insects were collected on the route from Quito across the Andes, down the Napo river, and along the river Maranon; all the Brazilian forms having been collected on the Upper Amazon, namely, the Maranon river, and its tributary the Napo. The collection, though not large, and comprising in most cases but a single individual of a species, is a very interesting one, though not full enough with the slight material at hand for comparison, to throw any new light on the distribution of species on the Eastern and Pacific slope of the Andes.

HYMENOPTERA.

Trigona mellicolor n. sp. Worker. Body throughout honey yellow, head very large and broad, while the abdomen is broad and short, triangular. The antennæ and mandibles are concolorous with the head, which is naked. On the thorax and end of the abdomen and legs are honey yellow hairs, concolorous with the rest of the body; the hind tibiæ are broad and flat and edged with long hairs, and the basal joint of the tarsus is very broad. The propodeum is blackish, though the black portion is not apparent from a tergal view of the bee. Length, .20 of an inch. Taken between Quito and the Napo river.

It differs from the description of Smith's *T. mellea*, from Brazil, in not having any "griseous pile" on the sides of the face, the hairs on the vertex being concolorous with the head. The mandibles have a slight inner tooth; the edge is smooth, oblique, ending in a point, and the abdomen is rather short, instead of being "elongate."

Bombus robustus Smith. Cat. Hym. Br. Mus., ii, p. 400, Quito.

Bombus funebris Smith. Cat. Hym. Br. Mus., ii, p. 400, Quito.

Xylocopa, two species, both females and probably new, occurred at Quito. One is brownish black, with black hairs and coppery wings, the veins reflecting a purplish blue tinge. Length, 1 inch. Another smaller species, .75 of an inch in length, like the other in an imperfect condition (wanting the head) is uniformly blue-black, with its body covered with dense black hairs, and deep blue wings. In both species the body is cylindrical, flattened slightly, with lateral hairs, making the abdomen look still broader; the legs are densely hirsute.

Centris braccata n. sp. Female. Entirely black brown, including the antennæ and legs, with a dense long velvety black brown hirsuties. Front broad, clypeus black, finely punctured, leaving a median narrow smooth area; labrum equilaterally triangular, with long black hairs; mandibles black, terminal third honey yellow, very unequally bidentate, the larger tooth very long and acute. The antennæ black on the three basal joints, flagellum lighter, being dark brown. Thorax densely hirsute, the hairs velvety and rather long. Wings black, with a well marked violaceous tinge, not transparent, veins black, three subcostal cells large and well developed. Legs hirsute, outer edge fringed with long hairs, posterior tibiæ and basal joint of tarsi with long dense hairs on the outside of the joint, forming a brush one-half as wide as long, being unusually broad, covering up the whole tarsus except the two terminal joints. The abdomen is long, conical, nearly naked, with short hairs at the tip, and with a long fringe of black hairs on the hind edge of the 5th segment extending to the sides of the body; 6th ring with a long, smooth, flattened, triangular tip, squarely truncated. Length, one inch. Route along the Napo and Maranon rivers.

Centris 4-maculata n. sp. Female. Head black, with few hairs and with scattered, rather coarse punctures, a conspicuous pale honey yellow triangular spot on the orbits on each side of the front, just below the antennæ, and an adjoining irregular rhomboidal little larger concolorous spot on each side of the front edge of the clypeus, which has a few coarse punctures, but is smooth in the middle. The mandibles are black, with a large upper tooth, and a slight pale discoloration on the inner tooth. Antennæ black and a little paler, being dark brown on the under side. Thorax black, with dense velvety hairs, becoming fulvous beneath and at the end opposite the base of the abdomen, though not apparent when seen from above. Anterior feet stout, black, with dark brown hairs, fringed with spare hairs; on posterior tibiæ a dense brush of long fringed spinulated pale fulvous hairs, the brush being one-half as wide as long, beginning on the tibiæ and leaving the four terminal reddish tarsal joints exposed; basal joints of tarsus lined with dense reddish spines, which are much larger on the edges. Abdomen smooth, shining rust-red, conical, duller colored beneath: the 6th segment edged with a long dense stiff fringe; tip naked, triangular, acute, slightly depressed along the middle, with a raised equilaterally triangular portion at the base. Length, .90 of an inch.

Route along the Napo and Maranon rivers. It may be known by its four-spotted face, the large fulvous brush of spinulated hairs on the hind legs, and the reddish smooth abdomen.

Euglossa bombiformis n. sp. Female. Head and thorax black, with dense short dark brown hairs. Front deeply excavated for the insertion of the antennæ, which are black; flagellum brown behind the two basal joints. Clypeus long, with an oblong raised mesial portion, with a square front edge and a strong mesial ridge. Labrum with a mesial strong ridge, and on each side a ridge, from which the sides fall rapidly away, leaving a mesial triangular area. Tongue and maxillæ .90 of an inch long. Thorax black beneath; legs of the same color, very stout and hirsute; hind femur very broad, length .40 of an inch; breadth .20 of an inch; smooth and shining, fringed with large stout black bristles; basal joint of tarsus smooth, with no hairs, but large stout spines, larger and more numerous and longer on the edge. Tegument of the abdomen greenish, only seen when the hairs are removed; abdomen yellow, basal ring black on the hinder edge, second ring black on the basal half; beyond yellow; third yellow, fourth to sixth rings rust-red. Wings black on their basal half, and when folded the black portion is even with the black ring on the abdomen; beyond yellow and clear at tips; they are long and large, with unusually long cells. Length, 1.20 of an inch. Quito.

Chrysantheda frontalis Guérin, Icon. p. 458. Both sexes occurred. The male, not before discribed, differs in not having the tubercle just in front of the ocelli which the female possesses, and the labrum is a little darker; on the meso-scutellum is a median ridge most prominent behind, and the mesial line on the mesoscutum is depressed, while in the female it is elevated into a slight ridge. The male also differs in having on the upper edge of the posterior half of the posterior femora a deep furrow filled with fine hairs, isolating a narrow green ridge, which looks like a spine appressed to the ridge. Length of the male, .85 of an inch; female, 1.20 inches. Route along the Napo and Maranon rivers.

Anthophora pilifrons n. sp. Female. Head entirely covered with rather long fine uneven white hairs extending to the labrum, and very hairy beneath. Maxillæ and tongue a little shorter than the front of the head. Mandibles broad, black. Thorax covered with reddish tawny hairs darker on the disk, and becoming whitish on the under side. Wings clear hyaline, third subcostal cell quadrangular. There are long hairs on the basal ring of the abdomen, which is black concolorous with the thorax, edged on the hind margin with pale tawny stiff hairs, the fringe becoming longer on each successive ring. Beneath, black, with a paler, thinner fringe, tip ending in a long, acute, stout, broad spine, convex above, and beneath a broad flattened mass of fine bristles. Legs hairy, black throughout, tarsi, especially the terminal joints, with reddish hairs, a brush of black hairs on the hind tibiæ and basal joint of tarsus; the tibiæ not being dilated and smooth as in the other species of the genus. Length, .50 of an inch. Quito.

Differs from *A. albifrons* Smith in the mandibles being black, in the square second subcostal cell, and acute spine-like tip of abdomen, which is conical. The antennæ are wanting in all three specimens.

Anthophora conica n. sp. Female. Front broad and full, especially the clypeus, which is rather convex, especially at the base. Head black, whitish yellow on the orbits in front of the insertion of the antennæ. Clypeus smooth, emarginate and raised on the front edge, with a few scattered punctures, except in the middle where it is smoothly polished and with a transverse yellow line, sending a vertical median line towards the base, like a ⊥, and tawny yellow hairs on the vertex, concolorous with those on the thorax and basal ring of the abdomen; sides of the thorax and beneath, with shorter, paler hairs. Mandibles very long and slender, yellowish, black at the extreme tip; labrum yellowish, long triangular, with pale hairs on the front edge. Abdomen black on the three basal rings, which are nearly naked above, being covered with flattened, very fine, stout hairs, except on the front part of the basal ring; on the second ring are two dull rust-red patches, nearly meeting on the median line, and two similarly colored smaller spots on the third ring, but situated lower down on the side. The fourth to the sixth rings are bright honey yellow with a reddish tinge, while short minute tufts of hairs on the basal three-fourths of the fourth ring, are succeeded by fine stiff separate hairs on the hinder edge. The fifth ring has but few hairs, with a heavy fringe of stiff hairs on the hinder edge; the tip of the sixth, or terminal ring is solid, naked, flattened, acutely triangular, with a raised solid portion at the base. The abdomen beneath and on the sides are uniformly much paler, almost testaceous. Legs rust-red, fore femora blackish above, middle and hind femora reddish above. Fore and middle legs fringed sparingly with rust-red hairs, especially on the basal joint of the tarsi. A dense broad flattened brush of pale reddish hairs on the hind tibiæ and tarsi, is concolorous with the end of the abdomen, leaving the four reddish tarsal joints exposed. Wings hyaline with black veins. Antennæ black, with a yellow stripe on the front of scape; flagellum brownish. Length, .60 of an inch. Route along the Napo and Maranon rivers. It may be known by the ⊥-shaped yellow spot on the clypeus, the four reddish patches on the base of the abdomen, its pale reddish tip, and the long slender mandibles. It differs from *A. apicalis* of Cuba, by its tawny hind legs, the vertex being covered throughout with hairs, and by the reddish spots on the abdomen; otherwise it closely resembles it, being structurally nearly identical. The specific name is given in allusion to the well-marked conical shape of the abdomen.

Anthidium pictifrons n. sp. Female. Head black, with tawny hairs between the insertion of the antennæ and the ocelli, becoming longer above; behind the ocelli are long tawny hairs. The triangular supraclypeal piece is reddish yellow. The clypeus is reddish yellow; on the front edge, connecting with a median band of the same hue, dilating on the base of the clypeus, and making a ⊥-shaped mesial band. Orbits anteriorly lined with the same color, dilating below triangularly. Antennæ of the same color in front, except the basal joint of flagellum and tip of scape; behind, blackish; tip pale brown. Mandibles honey yellow. Thorax black, covered densely with tawny brown hairs, much paler on the sides. Wings sub-hyaline, smoky on the outer half, with violet reflections; a slight yellowish tinge at the basal half of the wing; but one subcostal cell, and that faintly marked on the outer side. Legs black, with a whitish fringe of hairs; tarsi black, terminal joint reddish, with some reddish but mostly white hairs; hind tibiæ broad, convex, polished black, with a slight fringe of white hairs; a row of spines on the hind edge, and a long curved brush of bristles at the tibio-tarsal joint; basal joint of hind tarsus reddish, very broad, being but a fourth longer than broad. Abdomen rather long, oblong, black and naked, with a white fringe on the hind edge of each segment, with white hairs on the side, especially towards the tip; beneath each segment is brown, but paler on the posterior half of each ring, with fine pale brown hairs, and when seen laterally becoming frosty white. Length, .55 of an inch.

Napo river, Brazil. It differs from the other species in its long body, especially the abdomen; its broad, smooth, gaily ornamented front, and its smoky wings, which are dusky, with a violet tinge on the outer half.

Augochlora nigro-ænea n. sp. Female. Black brown with dark greenish and brassy reflections; front dark greenish, the indentation in the eyes well marked but obtuse. The head is covered sparsely with fuscous hairs, becoming darker behind the antennæ and concolorous with those on the body. The interantennal ridge is well marked, being thin and sharp, the clypeus is black on the front edge, except on the sides; the labrum is covered with fuscous hair, and the mandibles and antennæ are black. The mesoscutum is dark green, the hinder part of the thorax being of a much darker shade and black on the flanks. The wings are dark, smoky, especially on the outer and costal edges; legs black, with whitish hairs on the hind coxæ; the tarsi black with brownish hairs. The abdomen is blackish with greenish and purple reflections, except the fourth segment which is greenish, and the base of the three other segments are narrowly lined with green; beneath brownish black, the edges of the wings being testaceous. Length, .40 of an inch. Route between Quito and the Napo river.

Augochlora fuscipes n. sp. Female. This species closely approaches *A. nigro-ænea* in the disk of the thorax being dark, in the lighter green propodeum, the pale fuscous legs, and the distinctly purple upper side of the abdomen, and is throughout slightly smaller.

The head is as in *A. nigro-ænea*, the flagellum of the antennæ being a little brownish beneath. The clypeus is black on the front edge only, not extending so as to form the square spot seen in the other species, and the mandibles are piceous. The thorax is black, the propodeum being rather dark green. The abdomen is purplish black with green and bronze reflections. The wings are a little paler than in the other species, while the legs are bright fuscous, with pale hairs on the hind coxæ and femora. The abdomen is dark brown beneath, with pale reddish hairs. Length, .33 of an inch. Between Quito and the river Napo.

Halictus rimosiceps n. sp. Female. Head and thorax dark green, with a brassy tinge on the disk of the thorax. Head with very faint brassy reflections, with long white hairs on the orbits, especially on each side of the clypeus, and behind the eyes towards the vertex the hairs are smoky. Front edge of the clypeus black; labrum and mandibles and antennæ black. Propodeum darker than the rest of the thorax, naked, finely granulated, not lineated, with a conspicuous deep furrow on the vertical face. On the sides the thorax is covered with long whitish hairs in front of the insertion of the wings, behind they are smoky. Wings pale hyaline. Legs black, not differing in structure from *H. parallelus* Say. Abdomen dull black throughout, not paler at the sutures; nearly smooth above, with thin smoky hairs on the sides, and especially beneath. Supra-anal groove lined with fuscous hairs. Length, .40 of an inch. Quito.

Polybia angulata Fabr. Saussure, Monog. i, p. 185. The single female specimen, collected by the Expedition on the Napo river, agrees well with Saussure's description. Our insect is black brown, and the legs dark above, with a yellowish patch on the end of the femora, the tarsi being pale beneath.

Montezumia Andeus n. sp. Male. Jet black, with brownish black hairs on the head and thorax and basal ring of the abdomen. Front black, clypeus covered with silvery hairs, and terminating in two acute teeth, with a smooth black hollow between. Labrum and mandibles black, the teeth of the latter being obsolete. Antennæ black, flagellum brownish black; second joint of the scape with a reddish streak on the upper side. Wings dark purple. Legs bright red, black at the base of the femora, and yellowish at the tip and base of the hind tibiæ; the middle femora having a triangular expansion at base. The four terminal joints of the tarsi are black with fulvous hairs, having a silvery lustre on the under side, this lustre extending to the tibiæ. The abdomen is subsessile, this species belonging to Saussure's second division of the genus, and the basal joint is triangular, being a little longer than broad; it is jet black and smooth above and below. Length, .75 of an inch. Quito.

Odynerus nasidens Latr. Saussure i, p. 171. Napo and Maranon rivers. It agrees perfectly with Saussure's description, save that the hairs on the head are golden rather than silvery, and each tooth on the clypeus is yellow. Saussure's specimens are recorded as coming from "Columbia and Caraccas." It is possible our single specimen was taken nearer Quito than the label indicates.

Monedula 10-maculata n. sp. Female. Body black and smooth, with yellow bands and spots. Head black, with pale gray hairs on the front, becoming silvery on the orbits and on each side of the clypeus, the middle of which is raised into a triangular space, terminating in a smooth, narrow, interantennal ridge; in front, is a narrow perpendicular yellowish white mesial band; and the front edge in the middle is whitish yellow, concolorous with a whitish yellow orbital line, which continues to the extreme sides of the clypeus. Labrum longer than broad, black in the middle, with a yellow band on each side. Mandibles yellow, becoming pitchy brown towards the tips. Antennæ black, brownish on the flagellum and with a narrow yellowish streak on the under side of the scape. Thorax black, yellow on the sides, with a pale line on the hinder margin of the prothorax, and the mesoscutellum and metathorax above are bordered with pale yellow. The five basal rings of the abdomen are spotted on each side with an irregular yellow spot, broadest on the side, and narrow on the tergum, the fifth pair being one-half smaller than the fourth; the second pair approach nearest above, the fifth pair being separated by a distance equal to their length; tip of the abdomen black. Wings hyaline, a little smoky with a deep violet tinge and brown veins. Fore femora black with a yellow line above and beneath; middle and hind pair black above except a round yellow spot at the end of the hind pair; tibiæ black above; fore tarsi black, middle and hind pairs yellowish at the base of the joints, except the last one which is black. The under side of the basal ring of the abdomen is yellowish; a triangular yellow spot on each side of the three succeeding segments. Length, 1.08 inches.

Route on the Napo and Maranon rivers. Differs from *M. signata* Linn, by the dark clypeus, the black mesoscutum, the black base of the basal ring of the abdomen, the immaculate sixth segment, and the dark under side of the abdomen, and the darker legs. The wings are also darker, more smoky and give off decided violaceous reflections.

Scolia bisignata n. sp. Female. A large black species with two orange colored smooth bands on the abdomen. Head shining black, with scattered punctures on the smooth vertex, and below dense black hairs; antennæ black, flagellum duller black. On the mesoscutum is a smooth narrow heart-shaped disk, with a slightly curved furrow on each side, the rest of the thorax being punctured. Legs hairy and spiny as usual. Wings pale testaceous with reddish veins. Abdomen a little narrower than usual, black, with black hairs, and on the second and third segments a large orange band. The anal segment is flattened and covered with longer and thicker hairs than usual. Length, 1.30 inches. Quito.

Pepsis Quitonensis n. sp. Female. This species is closely allied to *P. formosus* (Say), but it is duller colored and the wings are darker, with a very slight reddish hue and darker towards the edge of the wing. The antennæ and palpi and mandibles are black. The propodeum is covered with long black hairs, and is not so heavily striated as in P. formosus, and there is no median furrow. The wings are tinged with reddish yellow, and dark at the base with blue reflections, and dark on the outer fourth of the wing; there is more black on the base of the hind wing than on the fore wings. Length, 1.10 lines.

Pepsis purpuripes n. sp. Female. Body long and narrow, naked with broad wings, green, with smoky dark wings and purple legs. Head smooth, green with a bluish tinge. Labrum and palpi dark brown; mandibles black, antennæ with the scape dark purple, basal half of the flagellum brown black, becoming yellowish on the last six joints. Thorax dark green with bluish reflections. The propodeum is rather long, with regular transverse striæ, some short and not running across the whole surface, with a slight mesial furrow, with a slight tubercle just below the spiracle, and another on each side of the posterior edge. The wings are dark, smoky throughout, slightly paler at the tip. The legs are dark purple, with the tarsal joints, except the basal, black; the legs have short spines, the tarsi have short spines, and the hind pair are scarcely flattened. The abdomen is cylindrical, green, with blue reflections, and equals in length the head and thorax; the tip is green, becoming blackish at the extreme point, with fine black hairs. Length, one inch. Route along the Napo and Maranon rivers. It belongs to the same section of the genus as *P. formosus* (Say) but its body is slenderer, the wings broader and the legs more slender.

Pepsis vinipennis n. sp. Female. A large dark blue species with the central portion of the wings of a rich wine color. Head dark indigo blue, with the labrum and mandibles black; scape of the antennæ dark blue; flagellum blackish at base, becoming dark brown towards the middle, and fuscous at tip. Thorax and abdomen uniformly dark blue, becoming lighter on the abdomen. Propodeum covered with minute appressed brown hairs; transversely striated, with a lateral spine in front of each spiracle, and a well marked lateral spine on each side behind, with a transverse well marked ridge on the hinder edge of the propodeum. Legs stout and large, bluish black, tarsi but slightly flattened. Wings smoky brown on the costal, outer and inner edges, with the central portion of a rich wine color, with purplish reflections, the reddish colored space extending to the outer transverse venules; the apex of the wing is pale hyaline; the hind wings are marked like the fore wings. The outer subcostal cell is shorter than broad, being rather shorter than usual. Length 1.50 inches; exp. wings, 2.75 inches. Route along the Napo and Maranon rivers.

Pompilus vinicolor n. sp. Female. Body with a peculiar lilac purple or wine colored tinge. Head wine colored, mandibles and scape of the antennæ black, flagellum yellow. Thorax vinous, more reddish above, and bluish on the side; wings opake throughout, dark blue, with violaceous reflections. Legs dark purple; tibiæ and tarsi black. The body is clothed with black hairs. The abdomen is paler reddish above than elsewhere; and on the venter becomes towards the middle almost black. The terminal ring of the abdomen is black, with dense fine hairs. Length, .90 of an inch. Quito.

Pelecinus polycerator Fabr. A specimen occurred on the Napo river which is injured and is referred with some doubt to this species. Its legs and antennæ are wanting. It only seems to differ from Massachusetts specimens in other respects in having larger wings, though with very similar venation, the lower subcostal vein, however, arising from the pterostigma being longer than in Massachusetts specimens.

Atta (Œcodoma) cephalotes (Linn.).* Female. Between Napo river and the Maranon, and also taken at Aspinwall.

Odontomachus hæmatodes (Linn.). Worker. Between Napo river and Quito.

Pachycondyla pedunculata (Latr.). Worker. " " " " "

" " (!) " Female. " " " " "

Ectatomma tuberculata (Latr.). Female. " " " " "

Camponotus atriceps! Smith. Female. " " " " "

" *tomentosa!* Norton. Between Napo river and Quito.

LEPIDOPTERA.

Ageronia Amphinoma Linn. Larvæ which agreed with Madam Merian's figure of this species, were taken on the route along the Napo and Maranon rivers.

Besides these there were several indeterminable larvæ, pupæ and adult lepidoptera in alcohol.

Chœrocampa Tersa (Drury) Nanegal.

Erinnys Alope (Drury). Upper Amazon? no locality given.

Cydimon Leilus (Linn.). Upper Amazon? no locality given.

Glaucopis tricolor n. sp. In this species, which seems to belong to Walker's section Hyda, as the third joint of the palpi is very small and conical, the palpi rise up nearly as far as the vertex; the antennæ are well pectinated nearly to the tips; the wings are broad and limpid, the edges narrowly bordered with black, and the body is slender and smooth, the abdomen being a little contracted, with a pair of conspicuous subterminal tufts.

Blackish brown, head dark, with a deep yellow line along the orbits and in front of the antennæ, and a median triangular yellow spot behind; palpi yellow, with a black stripe on the outer side; antennæ black. The whole under side of the thorax including the legs and the basal two-thirds of the abdomen is of a rich ochreous yellow. There are three yellow spots on the prothorax, and a yellow line along the centre of the patagia, which connects with the yellow beneath. The wings are transparent, with a narrow blackish edge, thickest towards the apex, and towards the base of the inner margin; the inner edge of the hind wings behind the internal vein is covered with dense brown hair-like scales, with a minute pale spot near the middle. The legs are yellow, with an external dark stripe, most marked on the tibiæ and tarsi. The abdomen is black at base above on the two basal rings, the third, fourth and fifth rings being deep scarlet, and the remainder black; there is a median interrupted yellow stripe on the five basal rings. Length of body, .68 of an inch; of a fore wing, .65 of an inch. Route along the Napo and Maranon rivers.

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* The *Formicidæ* are named by Mr. E. Norton.

Antarctia bicolor n. sp. Male. A small stout hairy moth more nearly allied in form to Euchætes than the other species mentioned below, but with shorter, broader wings, and a short, flattened, very hairy abdomen. The head is like Euchætes, but a little broader, the vertex being flatter, and the front more hairy; the palpi are large and stout, reaching beyond the head, the third joint being over half as long as the preceding one, where in Euchætes it is very small and no longer than the second joint is wide; antennæ a little more than half as long as the wing, with longer pectinations than in Euchætes. The thorax is stout and hairy; fore wings very short and broad, about twice as long as broad, the costal edge is straight, the apex very obtuse, and the outer edge less oblique than usual; the venation closely resembles that of Euchætes; the hind wings are rather large and like those of Euchætes. The legs are short and thick. The abdomen is flattened, short and thick, and very hairy, but does not reach as far as the outer edge of the hind wings.

It is of an uniform umber brown, the head and antennæ, legs and wings being of the same hue; on each side of the abdomen is a broad ochreous band, not reaching the tip, which is brown. The under side of the body and wings is concolorous with the upper side. Length of body, .32 of an inch; length of a wing, .40 of an inch, It is a much smaller species than Hübner's *A. brunnea* from Brazil, and while being smaller than *A. punctata* Packard, from California, is not spotted. Route along the Napo and Maranon rivers.

Halesidota pustulata n. sp. Male. White, with a slight buff yellow tinge, especially on the head and thorax. the abdomen, head and feet are pale buff; a brown spot on the outside of the first joint of the palpi, and another on the basal two-thirds of the second joint; two dark round spots on the prothorax; and two on each patagium. The fore wing is crossed by irregular faint pale buff lines, resembling Hübner's *H. concatenata*. On the basal third of the wing is a band composed of four lines enclosing three white round dots; across the wing at the discal venules passes another oblique irregular diffuse scalloped band; between this and the apex is a short band which goes from the costa to the first median venule; a submarginal scalloped band, beyond which the wing, especially towards the apex, is dull buff. The costa is irregularly spotted on the edge with dark buff. Beneath, the costa is buff yellow, and the wing appears to be crossed by four diffuse white bands, with smoky bands between, which are most distinct on the outer half of the wing. The hind wings are white above and beneath, with a slight buff tinge, especially on the costa beneath. The abdomen is buff yellow, deep buff, with a dorsal and lateral row of dark brown round spots. Length of body, .75 of an inch; of fore wing, .95 of an inch. Upper Amazon? No locality given.

Agrotis Ortonii n. sp. Brown ash color, with a very slight reddish hue. On the costa are four blackish patches, enclosing a paler spot concolorous with the rest of the wing. The two basal spots are the beginning of two lines which cross the wing, of which the basal is near the base of the wing, and is very zigzag, and the outer is zigzag, the bends having acute angles. The round inner discal spot is large and conspicuous, and below is a longitudinal oblong spot connected with the second transverse line. The reniform spot is large and well marked. There is a square dusky indistinct spot on the costa near the apex, and a few dusky blotches near the outer edge, with the usual marginal row of minute black intervenular lunules. The head and thorax are concolorous with the fore wings. Hind wings white, dusky on the outer edge. Beneath, the wings are pale, whitish, ashen on the costal and outer edges; the fore wings being whitish on the central portion. The palpi are dusky on the basal half. Length of body, .90 of an inch; of a fore wing, .89 of an inch. Upper Amazon? locality not given. It resembles in its form *A. suffusa* though smaller and with simpler markings on the fore wings.

Palindia geminata n. sp. Fore wings white, crossed by two oblique bands, and a third white narrower line; hind wings yellow, with an apical dark patch, and two geminate black spots on the angle. Head and prothorax pale tawny yellow; palpi of the same color, with numerous brown scales, the third joint is yellow at base and tip; a brown line across the middle of the clypeus; three brown lines on the prothoracic scales. Fore wings pure white, with three dark bands converging on the inner angles of the wings; the two inner bands are oblique, the inner the most so, and are formed of two dark lines, with dull white between (though it may be darker as the wing is a little rubbed); the third line is dusky, a little diffuse on the inner side; it is straight, and one-half as wide as the middle line, arising on the costa midway between the apex and the middle line; the outer edge of the wing is brown, the dark color disappearing on the apex, and at the internal angle. Hind wings deep yellow, becoming white at the base, and of a deeper yellow towards the outer edge. On the apex is a large roundish brown patch about as long as the thickness of the abdomen in the middle; at the outer angle of the wing which is well marked, are two geminate large round dots, with a white line between; a little distance in from the internal angle is a round spot but little larger than one of the geminate spots, which is touched by a white dash extending from the base of the wing. Beneath both wings are deep yellow; on the fore wings is a costal wedge-shaped blackish-brown band, which reaches to the base of the fourth median venule, and the apical third of the wing is blackish brown, becoming paler towards the apex, and not reaching to the internal angle. The hind wings are entirely yellow, not white at base, and without the dot near the internal angle; the apical spot and geminate spots are present. The body beneath and legs are concolorous with the head, while the abdomen is white at base, becoming yellow above and below on the terminal third. Length of body, .80 of an inch; of a fore wing, .90 of an inch. Upper Amazon?

Chœrodes bipunctaria n. sp. Of a fawn color with a lilac tinge. Head with the front dark brown, bordered with an interantennal white line, the vertex being fawn colored; the palpi are tipped with whitish; the thorax and abdomen are concolorous with the wings. The basal and outer third of the wings have a lilac tinge, the middle portion being darker and bounded by the inner and outer lines. The line is brown, being a little darker than the ground color, and is once angulated on the costa, and then goes straight to the inner edge; the outer line is considerably and regularly curved to the usual sub-apical angle, when it bends back acutely on the outer fifth of the costa, adjoining which is a costal white dot; midway between this and the apex is a blackish discoloration; the outer line is edged with a much paler hue, especially on the hind wings, where the line is straight; no inner line present. Beneath, the wing has a decided rosy brown hue.

Epione mustelinaria n. sp. Of a uniform pale sable gray, a little paler on the under side of the body and wings. Both pairs of wings are mottled, with blackish scales; the discal dot is round, not very prominent, though darker than the blackish scales surrounding it. On the costa just before the apex is the usual small triangular dark spot, from which a very faint diffuse band crosses the wing to the outer third of the inner edge; this line is reproduced beneath, where it is very much more distinct; beyond on both sides of the wing are a few submarginal flecks. The hind wings are the same as the fore wings, with the dark diffuse faint line just beyond the middle of the wing, and a still fainter submarginal slightly curved line. The discal dots are present on both pairs of wings, and on the under side. Length of body, .75 of an inch; of the fore wing, .80 of an inch. No locality given; probably Upper Amazon. This species is much larger than usual and seems to differ from all the other described Brazilian species by its pale uniform sable color.

Panthera pardalaria Hübner, Zuträge. One specimen from the Upper Amazon? No locality given. It does not differ from other specimens from Rio Janeiro in the Museum of the Academy.

ARACHNIDA.

Ixodes Naponensis n. sp. Body flattened, unusually smooth above, and regularly ovate. The head or part supporting the beak, is transversely oblong, being twice as broad as long, with square edges, the corners being sharp; and posteriorly ending in an acute tubercle. The beak as a whole is oblong, and but little longer than the basal joint of the foreleg. The soft submembranous maxillæ project slightly beyond the two-jointed palpi, which are enlarged towards the end; they are two-jointed, the second joint being a third shorter than the basal. The surface of the body is unusually smooth, with scattered very fine punctures, and marbled with two irregular white lines, most distinct anteriorly, and approximating on the posterior third of the body, where the lines consist of broken ringlets and dots. The surface is a little convex behind the head, sloping gradually to the general surface of the body. Hinder edge crenulated, with five crenulations on each side of the central one. The legs are stout, and smoother than usual, with a few hairs, not arising from fine tubercles. Length, .17; breadth, .11 of an inch. Our specimen is dried, and is of a reddish brown color, with deeper red legs. Napo river.

I add the following descriptions of a few American species from the Museum of the Academy.

Ixodes albipictus n. sp. Female. An elongated oval flattened species, marked with silvery white on the thorax and tips of the leg-joints. Beak broad, large and flattened, as long as one-third the width of the body at the widest. Palpi scarcely as long as the beak, broad, flattened, ovate, second joint nearly as long as the first; head transversely oblong with rectilinear angles, the two posterior ones being produced into an acute stout spine; on the surface is a pair of oval smooth pits diverging from the median line (at the bottom of which I can detect, however, no ocelli). The body is a little arcuate, being contracted at the middle of the thoracic plate; it is scattered sparsely with deep punctures, which are thicker and arranged in three lines on the side of the anterior half of the thorax. The smooth, shining thorax, is reddish along the middle, but darker on the sides, and around the outer edge is broadly margined with silvery white, being irregular within and broken up into points and dots; the middle behind the head is raised, convex, with a rather deeply impressed line on each side anteriorly. The whole white spot is nearly half the length of the body. Abdomen black brown; surface rough, with deep punctures and corrugations, with four irregular deeply impressed longitudinal lines not reaching the white spot; a submarginal deep line around the whole abdomen; end of the abdomen crenulated by thirteen lines. Beneath blackish brown; the body is smooth, with fine scattered punctures, becoming larger towards the end of the body; between the second pair of legs is a depression, surrounded by a circular impressed line (vulva); towards this two impressed lines converge, beginning at the end of the body, thus enclosing an acute triangle, near the base of which is another pit (anus) containing two twin tubercles, twice as long as broad. Legs red, coxæ of the two front pair with a stout spine, that of the first pair three times as large as in the second; the legs are stout, with short hairs beneath, and the joints above are either partially covered or tipped with silvery white. Length of body, including palpi, .20 of an inch; width, .12 of an inch. Closely allied to Say's *I. variabilis*, but the white is confined to the thoracic shield, and the body is dark brown, the legs are deeper red, and the incisures are not white as in *I. variabilis*, while the body is more oblong, the convexity behind the head much more marked, the impressed lines limiting it, extending farther behind. We found one specimen of this and Say's *I. variabilis* at Munson's Hill, near Washington, D. C.

To *I. albipictus* I refer specimens found by Mr. W. J. Hays in great abundance on a moose which had been kept in confinement in Nova Scotia; and noticed and figured in the *American Naturalist*, vol. ii, p. 559. The figure (*e*) of the adult after it had laid its eggs, is worthless, as its form had been distorted, but the palpi are the same, and also the silvery thoracic shield, though in the Nova Scotian specimens the silver is more diffused over the middle of the thorax, and the upper part of the joints of the legs are silvered over, and the deep punctures have disappeared. Length of egg 2¼ one hundredths of an inch; length of freshly hatched young, nearly .03 of an inch. Length of the adult after oviposition, .40 of an inch. The young is deep orange red, the legs a little paler, the body is smooth, convex, without punctures, and with ten minute impressed lines on the hinder edge of the abdomen; anal papilla present; the thoracic median convexity just behind the head is well marked; the head is a little larger in proportion than in the adult first described. According to Mr. Emerton's drawings the third joint of the palpi is free, though very small and tipped with hairs; the beak (*a*) is armed with five rows of teeth besides those of the extreme tip, and the maxillæ with nine rows of teeth, with four large terminal ones. The pulvillus of the claw (*d*) is much larger than in the adult. Except in the addition of a fourth pair of legs, and the differences noticed above, the larva does not essentially differ from the adult. The ticks, according to Mr. Hays, began to lay their eggs on the first of May, "and continued to do so until the 25th of June, when they died. The eggs are forced out in large masses. On the 3d of July, the day after I sent the drawings to you, the entire mass of eggs seemed to hatch at once, the shell opening like a clam and releasing a six-legged insect."

Ixodes nigrolineatus n. sp. Female. Body oblong oval, the sides very straight, not arcuated, being much more oblong, with much straighter, less curved sides than in *I. variabilis*, while the body gradually increases in width to the end; it is much thicker. Head not so wide as in *I. variabilis*, depressed centrally, with the sides much thickened and ending in an unusually stout thick obtuse spine, tipped with black; palpi and beak of the same length, both being short and small; palpi ovate, broad at end, second joint shorter than the first. Thoracic shield not distinct; the convexity and impressed lines observed in the two preceding species are obsolete, there being a slight convexity just behind the head. Body behind irregularly spotted and lineated with irregular faint linear black lines, being transverse in the middle of the body, while posteriorly there are three longitudinal parallel faint black lines; the surface is smooth, polished, with scattered punctures, becoming rather dense behind. Hinder edge with a slight ridge, incised by about ten abbreviated rather indistinct lines. Beneath, the body is paler, legs concolorous with the body, short and thick, much more so than in *I. variabilis*. The color of the single specimen, which is dry, is a deep blood red. Length, .16 of an inch; breadth, .10 of an inch. Taken Feb. 3, from Cervus Virginianus, Northern New York. (F. G. Sanborn.)

Ixodes unipunctata n. sp. Female. Body orbicular, flattened, with a central white spot, and joints of legs tipped with white. Head as long as broad, smooth, with two eyes (?) sunken in round pits, hinder edge emarginate, but not angulated on the sides. Mandibles and maxillary palpi very long, palpi slender, long, with the second joint half as long as the first; beak smooth, spinulated at the tip; labium with the basal half smooth, slender; beyond much broader and densely spinulated. Thoracic shield extending beyond the middle of the body, polished, thickly punctured, with two impressed lines behind the head, and on the hind edge which is a little produced, a conspicuous white spot, hind edge of body crenulated with twelve lines; legs rather pale, slender, with the joints tipped with white. A white ring nearly surrounds the anus, and the spiracles, situated on the edge, just behind the hind pair of legs form conspicuous scales. Length of body, .15 of an inch; width .08 of an inch. Body reddish; a single dried specimen from Mass. (F. G. Sanborn). Mr. J. Stauffer of Lancaster, Pa., has also sent me a drawing of this species which had almost completely buried itself in the arm of a girl, producing a raised tumor.

Ixodes Cookei n. sp. Female. Body thick oblong oval, being less orbicular than usual, smooth, leathery. Head transversely oblong, but somewhat rounded in front at the insertion of the mandibles, being a little longer than usual; the posterior angles, which are minute, are produced acutely. The mouth-parts are small maxillary palpi short and very broad, scarcely longer than the head is wide, the inner edge being expanded into a slight angle in the middle; beak small, slender, reaching to the end of the palpi; labium narrow, covered with spines. Thoracic shield about as long as broad, produced triangularly behind; median convexity slightly marked (though distinct in the young), the two impressed lines being nearly obsolete; surface smooth with fine shallow numerous punctures. Body behind leathery, with microscopic wavy lines; hind edge without any crenulations. Vulva situated between the third pair of legs. Body dark reddish brown (young much paler) with pale red slender legs. Length of body, .21 of an inch; width, .12 of an inch.

From the Woodchuck (Arctomys monax), Salem, Aug. 26. This species is named after its discoverer, Mr. C. Cooke, who has added many species of animal parasites to the Museum.

Ixodes leporis-palustris n. sp. Female. Closely allied to *I. Cookei*, but a little more orbicular; the body is thick, smooth, not punctured, and the thoracic shield is nearly-one third the length of the body exclusive of the mouth-parts, with scattered punctures; the median convexity extends nearly to the hind edge of the shield, the impressed lines being strongly marked. The maxillary palpi are still more triangular on the outer half; the mandibles project slightly beyond the palpi. The vulva is situated between the second pair of feet, which are paler red than the body, which is dark blood red. Length, .14 of a inch; width, .09 of an inch. From Lepus palustris, Fort Macon, N. C., Feb., 1869. Dr. E. Coues.

Ixodes chordeilis n. sp. Female. Allied to the two preceding species, the thoracic shield being distinct and small, while the body is thick and leathery. The palpi are very short and broad, when placed together forming a triangle wider than long, being scarcely twice as long as the head itself, and together much wider; they are equilaterally triangular, and conceal the beak; the basal joint is nearly square, the second being triangular; labium small, shorter than usual, rather narrow, and covered with spinules. Head transversely oblong, being just half as long as wide, with straight sides; the hind angles are rectangular, but not produced into spines. The thorax is shield-shaped, rather small, not much longer than broad; the usual convexity is distinct, contracted in the middle, the impressed lines being curved; surface thickly covered with shallow punctures, dark red, concolorous with the legs, the body being very dark blood red. The body is rounded oval, the legs being short. The vulva opens nearer the head than usual, being situated just behind a point opposite the space between the first and second pair of legs. The anus opens near the middle of the body. Length, of body, .25 of an inch; width, .17 of an inch.

From the Nighthawk (Chordeiles popetue), Mass. (Coll. F. G. Sanborn).

Ixodes bovis Riley (MS.) A reddish coriaceous flattened species with the body oblong oval, contracted just behind the middle; head short and broad, not spined behind, with two deep round pits; palpi and beak unusually short, palpi long and slender; labium short and broad, densely spined beneath; above, the mandibles are smooth, with terminal hooks; thoracic shield distinct, one-third longer than wide, smooth and polished, convex, with the lyrate mesial convexity very distinct. The whole body is sparsely covered with minute hairs. Legs long and slender, pale testaceous red; coxæ not spined. Length of body, .15 of an inch; width, .09 of an inch. Missouri Coll. C. V. Riley. This is the Cattle Tick of the Western States. Several hundred specimens in different stages of growth, have also been received from Pulvon, West Coast of Nicaragua, taken from the horned cattle and on a species of Dasyprocta, by Mr. J. McNeil. They preserve the elongated flattened form, with the body contracted behind the middle, by which this species may be easily identified. The largest specimens measure .50 by .30 of an inch. When gorged with blood they are nearly as thick through as they are broad. In the freshly hatched hexapodous young, and the young in the next stage of growth, the thoracic shield is one-third the size of the whole body, which is pale yellowish, with very distinct crenulations on the hinder edge. The fourth pair of legs are added apparently at the first moult. It is called "Garapata" by the inhabitants of Nicaragua.

Ixodes Bibronii Gervais, "Hist. Nat. Insects, Apteres," iii, p. 248. Body of a small female larger than usual, of a deep blood red, marbled sparingly on the sides with white. Head small, considerably sunken below the surface of the thorax, owing to the swollen state of the body; it is not much broader than long, and the surface is slightly convex, smooth. Palpi a third longer than the head is broad, stout, hollowed within; the second joint is one-half as long as the first, the articulation being unusually well marked. Mandibles smooth, rounded, unarmed, except at the tips, where there are five curved spines reaching as far as the end of the palpi; labium thickly spinulate beneath. Thorax well marked, triangular behind, no longer than broad; the central lyrate convexity very distinct, the impressed lines suddenly contracting behind the front edge, while on each side of the head the thorax is produced into a thick acute projection; surface dark red, with a few coarse punctures, but not marbled with white as in the young. The body is smooth, shining, with microscopic lines. On the sides are two broad irregular patches of white, containing red punctures and an irregular white patch on the end of the body. There are two stout spines on the coxæ of the two anterior pair, and one on the two posterior-pairs of coxæ. Length, .75 of an inch; breadth, .55 of an inch. Taken by Mr. J. McNiel from a Boa at Pulvon, West Coast of Nicaragua. Younger specimens agreeing with Gervais' description, were taken by Mr. McNiel from the skin of a Boa, Nov. 23. Additional specimens received more recently from Mr. McNiel were taken at Pulvon, from horned cattle, in company with *I. bovis*, and specimens occurred on a Dasyprocta, an iguana and a rattlesnake.

Ixodes perpunctatus n. sp. Allied to the last, but larger, and wanting the spines on the hind edge of the head, while the body is more densely punctured than in any of the species noticed above. Head sub-triangular, not much wider than long, punctured, hind edge a little emarginate, the angles being rounded. Palpi a little longer than the beak, spatulate, increasing in width to the tip, second joint half as long as the first. Mandibles smooth on the upper surface, terminal hooks much as usual; labium smooth on the basal half. Body regularly ovate, a little more pointed in front than usual, lyrate impression shorter than broad, no distinct thoracic shield. The body is red, very densely punctured, marbled with metallic green on each side of the middle of the body and on the end. The usual twelve short marginal posterior impressed lines present, with a submarginal impressed line around the hinder half of the body, and posteriorly just in front of this line are three parallel longitudinal furrows; all the coxæ have a single small spine. Vulva situated between the second pair of legs. Length, .33 of an inch; breadth, .20 of an inch. South America? Museum of the Academy.

VERMES.

Peripatus Edwardsii Blanchard. The best description and figures of this remarkable worm, is by Grube, in Müller's "Archiv" 1853, p. 322. Taf. ix and x. His specimens came from Venezuela; a single specimen from the banks of the river Napo. Mr. McNiel has taken one specimen at a station on the Panama Railroad.

REPORT ON ETHNOLOGY.

This department is composed principally of the collections received from the East India Marine Society, but fully one-third of the whole has been deposited by the Essex Institute. No estimate of its size or perfection can be made in numbers, if indeed it were desirable. It will probably be several years before it is in such order, or so thoroughly studied and catalogued, that an accurate account of the most valuable features can be given. For reference by special students and investigators, it ranks very high, being surpassed, in this country, only by the Ethnological department of the Smithsonian Institution.

The materials from the South Sea Islands are especially valuable and interesting, though in this we are still behind the Smithsonian. They comprise a nearly full series of the implements of husbandry, weapons, dresses, etc., illustrating very completely that period in the history of these island tribes when they first came in contact with the white man. These implements and weapons of stone, wood, or bone, and the rude textures woven from grass, or beaten out of the bark of trees, being now superseded by the iron tools and superior fabrics of civilized peoples; the relics of this early and interesting stage of savage life are fast becoming unattainable. Even the races themselves, in some instances, are disappearing before the advancing step of the European, and it is a matter of congratulation that we have such a fair series of their products. Africa, India, Arabia, the region of the Celebes, China, Japan, and the Mongolian races along the shores of the Northern Pacific, are all represented. Central and South America are also not deficient, but of the North American Indians we have unfortunately very little to show. The bows and arrows pointed with stone, stone tomahawks in rare cases, and the skin dresses of the Western savage, may still be obtained, but they are rapidly passing out of use, and in a few years it will be impossible to fill this blank in the Museum.

The greater part of the collection owes its existence to the officers of merchantmen which formerly sailed out of Salem harbor. The liberality and the enlightened policy that prompted such a course is deserving of the highest tribute of praise, and we sincerely hope that here, at least, the present race of officers will prove themselves worthy of their descent, and maintain the reputation of their predecessors.

It would unquestionably be a great advantage to the public interests of the cause of education, and creditable to their profession, if the owners and masters of vessels would exert themselves in behalf of this collection. An institution founded for the express purpose of promoting knowledge, and whose Museum is one of the principal instruments to be used for that purpose, should not, for obvious reasons, have to ask twice, and I hope in my next communication to be able to report many additions to this department.

We do not ask mere curiosities, but the *common things* used and worn in foreign countries; those of native manufacture being the most desirable, especially suites of specimens, such as sets of cooking utensils, sets of tools, models showing the different castes, or ranks of society, and their avocations; anything in fact, throwing light upon the past or present history and habits of the people.

Duplicates are not objectionable, on the contrary it will frequently be of great advantage to the Museum to have a number of one kind; thus no one need be deterred from bringing the *commonest product* from any foreign land, as everything will be thankfully received.

In this connection, also, permit me to allude to the spears, bows and arrows, shields, dresses and so on, which are stored away in the garrets and out-buildings of many residences in Salem and its vicinity. These neglected and dusty relics would be gladly received into the Museum, and the donors would then have the satisfaction of knowing that they had assisted in the broad field of public culture.

The arrangement was begun upon a provisional plan, which enabled the officers to sort out the large mass of material with greater care than would otherwise have been possible, and to place it in the cases.

The whole was classified in several divisions, under the superintendence of Mr. Putnam — as weapons, domestic implements, boats and models of vessels, dresses, etc. Dr. Packard arranged and placed in the cases the largest division, including the dresses, ornaments, religious emblems, etc. Mr. Cook, the domestic and agricultural implements, instruments of music, etc., and largely assisted at different times in the work upon the other divisions. Mr. Morse, who began the arrangement of the clubs, was obliged from the pressure of other engagements to abandon them, and they, together with the other weapons and models of vessels, etc., were arranged by the Curator. As it now stands, the Ethnological collection occupies all the case room on the eastern side of the hall, and a portion of the gallery railing. After the whole collection had been for some time in its place, two of the cases on the southern side were emptied of their contents, and the idols being removed to them, more room was obtained for the dresses, and this division had to be moved. The amount of labor on the whole Ethnological collection, classifying, ascertaining doubtful localities, and placing the specimens in the cases, may be estimated by the fact that it took fully three weeks of constant labor merely to spread out this portion, so as to show it to greater advantage in this additional space, which, however, is still insufficient. The dresses are crowded, and many hang back of the shelves so that they cannot be viewed to advantage. If properly displayed these costumes should be hung upon wire supports, perfectly free from the wall and admitting of easy removal. Many of the fabrics are injured by handling, and could be protected by this expedient, beside being removed from contact with the wall, where they are more liable to be moth-eaten.

I have already referred to the dresses from the South Sea Islands, and they need not be mentioned a second time, but I wish to draw attention to the Chinese section. Although many costly and interesting articles of apparel and ornament have been donated to this section, it is still very imperfect, and it would be very gratifying to have this deficiency supplied. In China, as in India, one may obtain manikins representing every caste, engaged in its habitual occupation, and it will be unfortunate, if, in a city having so many persons directly connected in trade with China, we cannot secure a full series of these, as well as the actual dresses and accompanying ornaments. The dresses and manikins of the different castes from Calcutta, form an almost complete suite but we still need dresses and models from other parts of India. The series of domestic implements, toilet articles, pipes, musical instruments, and specimens of art, fairly represent the African and Mongolian races, and have about the same excellences and deficiencies apparent, as in all the other divisions.

The weapons from the South Sea Islands are very complete, and also greatly crowded. The display of Malay Kreeses is especially fine, filling nearly one case.

The boats and vessels form a series of great value, comprising models of all sorts, including four American vessels, two men-of-war, a merchantman and the Great Eastern, so that a nearly complete general series may be arranged. Some of the models are exceedingly valuable, especially the last four mentioned, both as means of comparison with the canoes and more elaborately rigged boats of savage or semicivilized tribes, and on account of their historical value, as accurate copies of famous vessels.

My object in this report has been to show deficiencies rather than dwell upon the great and acknowledged excellence of the collection, hoping by this means to attract the attention of those who have the opportunity of supplying them.

A Hyatt, *Curator.*

REPORT ON GEOLOGY.

This department, so far as exhibited, is confined to the rocks of Essex County. It comprises a very full series of Porphyries from Marblehead, donated to the Essex Institute at various times, principally by Mr. Gregory, of that town, and Mr. Higbee, of Salem, as well as specimens of the granitic rocks and minerals of the County. It is desirable that we should possess in this department blocks and slabs, of a specified size, from all the quarries in active operation within our County. This collection would prove of great value to engineers and architects, for reference when selecting the materials for buildings, and the labels should mention the special qualities and points of excellence claimed for each kind of stone. For convenient arrangement and handling, the blocks should never exceed one foot square, or the slabs two feet square, and not over three inches in thickness.

The remainder of the geological collection is arranged in drawers and deposited in the basement. When sufficient case room is provided, a series may be made of these, showing the aspect of different kinds of sedimentary and volcanic rocks, which will be sufficient for the general collection and the illustration of lectures on the principles of Geology.

The increase of the number of specimens in this department beyond the present limits will depend upon the development which it may be thought necessary to give to geological chemistry, during the future progress of the Academy. When the general collection is exhibited and begins to be used for educational purposes, however, it will be found necessary to purchase maps in relief of the more celebrated localities, and sets of models illustrating geological subjects of practical importance. Without these no collection would be complete which pretends to give the observer or student any comprehensive idea with regard to the relations of cause and effect which exist between the geológical structure of the Globe and the present aspect of its surface.

A. Hyatt, *Curator.*

REPORT ON PALÆONTOLOGY.

This department is principally furnished by the deposits of the Essex Institute and the series purchased from the Curator; the fossils of the East India Marine Society collection being but a small pȧrt in comparison with these.

It is a gratifying fact that the receipts from donations and exchanges, partly to the Essex Institute and partly to the Academy, has increased the whole collection about one-third since the organization of the

Academy. Among the most noteworthy of these are two lots from Dr. Packard, one of fossils from the Drift formation, containing much valuable material, the other from the Niagara Limestone, at Chicago, authentically named by A. H. Worthen, State Geologist of Illinois; a fine lot of subcarboniferous specimens and remains of Devonian fishes from Prof. C. A. White, State Geologist of Iowa; an invoice, principally from the Hamilton Group sent by Prof. James Hall, State Geologist of New York, all authentically labelled; an exchange from Prof. A. Hurd of Knox College, Illinois; and a donation from Henry Davis of McGregor, Iowa, from the Trenton Group. The remainder of the accessions will be found recorded in the general list of additions to the Museum.

The entire collection has been arranged, and temporarily classified according to the strata in which they occur, changed into card-board trays and placed in regular order upon the shelves of the wall cases assigned to them on the west side of the Hall. They are now undergoing the last and most laborious process of being mounted upon wooden tablets, and catalogued. The greater part of the cataloguing has already been finished, and the mounting, but recently begun, is proceeding with all possible rapidity.

The specimens are at present very much crowded, though a large portion still remains in the work room. After the mounting and cataloguing is completed, it is intended to remove from the cases all those which are not prominently characteristic of the various geological horizons, and thus make space enough for the proper exhibition of such species as may be deemed typically illustrative of the laws which have governed the creation and progress of animal life. Probably the current additions to this department from donations and exchanges, will in some measure defeat this project. But much may be done by weeding out with an unsparing hand, all specimens, however attractive to the eye of the Palæontologist, which do not demonstrate some distinct step of this history. The general plan of this arrangement will be made in accordance with some standard work on geology, probably Prof. Dana's Manual of Geology. Those species which are not needed in the general collection, will be classified and arranged, and placed in safe and accessible repositories for the use of the special investigator or student.

The department is already sufficiently well provided for commencing this plan. It contains no extensive and complete suites of any of the zoölogical divisions of extinct animals, but a number of separate lots, all more or less characteristic of different strata, and containing a very large proportion of species in comparison with the number of specimens.

While the collection of the Essex Institute was being packed up preparatory to its removal to this building, the Curator became aware that it needed filling out in its list of the Silurian, and with a few notable exceptions of the Devonian fossils. A trip was accordingly made by him to the principal localities in New York State during three months of the summer of 1867, with the view of supplying this deficiency. The facilities then enjoyed enabled him to gather a large number of specimens suitable to the wants of the Academy. No effort was made to accumulate rare species, but the time was spent in searching for such representative species as would furnish good characteristics of the different strata of the Silurian and Devonian epochs. The whole, numbering thirteen hundred and fifty lots and about one thousand species, has been purchased by the Academy for a sum considerably less than their actual cost. This and the accessions previously mentioned are in themselves twice as large as the whole of the old collection.

The Curator has been hitherto exclusively employed in working up our own materials for the Museum, but opportunity should be taken during the early part of next year, to reciprocate the exchanges which are owing to many of our correspondents. Several gentlemen to whom we are indebted have been long anticipating some return, and appropriate exchanges will be made as soon as the arrangement of the collections will permit.

The department is indebted to the *American Naturalist* for several additions, and more especially for an important chance which its advertising columns have afforded of acquiring some of Prof. Ward's valuable casts. The Curator ventures the hope that these may be the nucleus of a series of the remains of the larger extinct animals. The absence of so many of the skeletons of the huge fossil fishes, reptiles and mammals, will leave inconvenient gaps in the general collection, unless filled before the final arrangement of this portion of the Museum is finished. The *Naturalist* has also obtained for us, through the same medium, a number of very acceptable fossils from Mr. Brewster of Boston.

A. HYATT, *Curator.*

REPORT ON THE MOLLUSCA.

During the year 1867, a portion of the Curator's time was spent on the collections of the Boston Society of Natural History, and a greater portion of the present year has been spent in preparing the illustrations for the new edition of *Gould's Invertebrata of Massachusetts.* The time was paid for, severally, by the Boston Society and the State.

The work accomplished for the Academy, is as follows.

Various collections have been merged into the general collection and arranged systematically on the table cases allotted to this department, among these may be mentioned the fine series of Indo-Pacific shells.

No attempt has yet been made to prepare the general collection for final exhibition and the specimens are still in their original paper trays. This work is to be carried on simultaneously with the arrangement of the collection of the Boston Society of Natural History.

The following special collections have been permanently mounted on black wooden tablets, and are on exhibition. The Essex County series, consisting of the True, Haskell, Tufts, and other lots, have been merged together, and number 209 species. This is composed principally of Marine species, and considerable collecting will be necessary to make it complete.

Layard's South African collection, and the Smithsonian Panama collection, numbering 350 species.

The finest special collection, however, consists of West Coast species, from the Gulf of California, vicinity of San Francisco and Alaska, presented by R. E. C. Stearns, Esq., Director of the California Academy of Natural Sciences. This gentleman is making every exertion to render our collection of West Coast species as complete as possible, and the Academy is deeply indebted to him for these many valuable donations and for other favors. The final mounting of the Stearns collection is nearly completed, and when finished over 1000 species will have been permanently mounted and placed on exhibition.

Nearly all the species figured for the new edition of *Gould's Invertebrata of Massachusetts* have been drawn from the Academy's collections. Thus the Academy will have nearly all the type specimens used in the illustration of this valuable work.

The following are the donations of Mollusca, two-thirds of which were received through the medium of the *American Naturalist.*

Dr. N. Cressy, ten species from Canaan, N. Y. Dr. James Lewis, eighteen species from Alabama. J. A. McNiel, sixty-five species from Michigan. E. S. Wheeler, two species from Savannah, Georgia. R. E. C. Stearns, three hundred and fifty species from West Coast of North America. E. K. Stevens, one species from Boston Harbor. Dr. G. A. Perkins, one species from Salem Harbor. Stevens & Chamberlain, three species from Massachusetts Bay. W. G. Binney, seven species from Newport, R. I. Henry Davis, two species from Upper Iowa River. J. C. Osgood, one species from West Coast of Africa. Museum of Yale College, ten species from Panama, and eleven from Florida. W. H. R. Lykins, three species from Kansas City, Mo. J. A. McNiel, one hundred and thirty-three species from Costa Rica and Nicaragua, and eleven from Panama. Dr. F. G. Brown, five species from Madeira. Capt. N. E. Atwood, three species from Grand Banks. Prof. B. O. Pierce, eighty-four species from Cape Town, Africa, and seventy from Georgia. Prof. C. A. White, five species from Northern Iowa. Rev. J. W. Cook, seven species from Laramie Plains, Dakota Territory. E. H. Jenks, twenty-one species from Pawtucket, R. I. Dr. H. Wheatland, one species from Charleston, S. C. C. A. Atkins, one species from Maine. W. Hammiston, seven species from Minnesota. John Bartlett, five species from Merrimack River. L. E. Chittenden, one species from Lake Champlain. E. Jewett, ten species from Saratoga Bay, Fla. R. E. C. Stearns, eleven species from Florida. J. Merrill, five species from New Hampshire. Miss M. G. Wheatland, two species from Florida. H. F. Shepard, thirty-one species from Massachusetts. Edward Burgess, five species from Jacksonville, Fla. J. A. McNiel, two species from Straits of Magellan. Total number of species, nine hundred and four.

E. S. MORSE, *Curator.*

APPENDIX TO REPORT ON MOLLUSCA, BY E. S. MORSE.

While arranging the duplicates of Essex County shells, I discovered the following interesting species, heretofore confounded with *Cyclocardia borealis Conrad.*

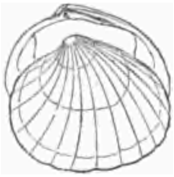
ACTINOBOLUS Klein.

SUBGENUS CYCLOCARDIA CONRAD.

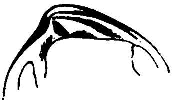
Cyclocardia Novangliæ Morse (nov. sp.). Shell oblong ovate, thin; beaks nearly central, recurved, rounded, not prominent. Surface of shell marked by about seventeen rounded radiating ribs, leaving narrow interspaces. Periostraca light brown, marked by delicate incremental striæ. Lunule impressed triangular; ligament nearly concealed. Hinge plate narrow and thin, having in the left valve a small triangular tooth on a vertical line with the beaks, and a long slender lateral tooth running nearly parallel with the ligament; in the right valve a long slender lateral tooth. Interior of shell white, margins strongly crenate.

Length, $\frac{27}{32}$ of an inch; height, $\frac{23}{32}$; breadth, $\frac{12}{32}$.

Color of soft parts in alcohol, light olive green.



C. Novangliæ.



Hinge plate of C. borealis.

OBSERVATIONS.

A comparison of this species with *C. borealis* Conrad will show the following important differences. The shell is elongate ovate; the beaks are nearly central; the hinge plate is only half as thick as that of *C. borealis*, and the shell itself is much smaller; the relative dimensions are different, while *C. borealis* is as high as it is long; in *C. Novangliæ* the length exceeds the breadth nearly a sixth. It is also much more compressed.

The ribs are one or two less in number and are not so sharp, nor do they appear to be cut up into bead-like processes by the concentric striæ as in *C. borealis*. In all specimens examined of *C. borealis*, fine radiating lines are seen marking the periostraca. This feature is wanting in *C. Novangliæ*. The color of the alcoholic specimens of *C. borealis* is light yellow.

The following shows that *C. Novangliæ* is quite southern in its distribution. Of 778 specimens of the two species examined from Portland to Labrador, twenty-nine only were of *C. Novangliæ*, while of fifty-five specimens examined from Massachusetts, forty-four were of *C. Novangliæ*. Dr. Nolan sends me a tracing of Conrad's original figures of *C. borealis*, which is precisely like the specimens from Labrador and Eastport, though the specimen was collected in Massachusetts.

Mr. S. I. Smith informs me that the few specimens of fossil Carditæ from this coast were all *C. borealis*.

REPORT ON THE RADIATA.

All the work done on the collections in this department has been performed by Mr. Putnam and Mr. Cooke.

The corals have been arranged in the northern central case and are mostly identified and catalogued.

The following are the donations of Radiates.

R. E. C. Stearns, five species from Tahiti. Capt. Geo. F. Emmons, one species from Gulf of Nicoya, Costa Rica. R. E. C. Stearns, four species from Florida. Capt. J. Warren Perkins, one species from Marquesas Islands. Charles B. Fuller, one species from North Carolina. H. B. Griffin, one species from Rockport, Mass. Nathaniel Kinsman, one species from Trinidad, Cuba. L. T. Lee, six species from Tortugas, Fla. Dr. G. A. Perkins, one species from Salem Harbor, and two species unknown. G. P. Farrington, one species from Florida. Geo. Fowler, one species from Hampton Beach. Total number of species twenty-five.

E. S. Morse, *Curator.*

DONATIONS TO THE MUSEUM.

The following additions to the Museum have been received since its organization to the 26th of December, 1868. Number of donors one hundred and forty; separate parcels two hundred and five.

Amory, Copley, Boston. An Esquimau Kayak from Labrador.

Atwood, Capt. N. E., Provincetown. The Cervical vertebræ of a Black-fish from Provincetown. Two species of Mollusks from the Banks. Two species of Mollusks from Provincetown. One Echinarachnius parma from Provincetown. Three species of Polyzoa from the Banks.

BAIRD, Prof. S. F., Washington, D. C. Humerus of Alca impennis from a Shellheap near the Light House, Ipswich, Mass.

BARNARD, JAMES M., Boston. A Water-color Painting of Chelys Matamata, by J. Burkhardt, from a living specimen in the possession of Prof. Agassiz.

BEMIS, Miss CAROLINE E. A living specimen of a young Alligator from Florida.

BICKNELL, EDWIN. Specimens of Penella, parasitic on the Sword-fish, taken forty miles off Portland. Galls from the Hickory.

BICKNELL, E., MORSE, E. S., and PUTNAM, F. W. A collection of Bone Implements and bones of various animals from the Shellheaps on Goose Island, Casco Bay.

BREWSTER, C. G., Boston. One mounted specimen of Dasyurus viverranus from Australia. Skulls of eight species of Mammalia from various localities. Myia squinado and Echinus edulis from the Mediterranean.

BRIGHAM, T. Skull of a Beaver, and several Mollusks and Corals.

BROOKHOUSE, R., JOHNSON, E. S., EMERTON, J. H., HYATT, A., COOKE, C., and PUTNAM, F. W. A collection of Bones of various animals, pieces of Pottery and two Stone Implements from the Shellheaps at Plum Island.

BROWN, Dr. FRANCIS G., Boston. Forty-seven specimens of Land and Marine Shells from Madeira.

BURGESS, EDWARD, Boston. A collection of two hundred American and twenty foreign Birds' Eggs. Gall-flies and their parasites. Shells from Florida.

BURNHAM, W. H., Essex. Two specimens of Pimpla from Essex.

BY PURCHASE. A living specimen of the Bald Eagle, young, from Salem Harbor. Eight mounted Birds from Maryland. Three specimens of Herring Gull from Salem Harbor. One specimen of Great Gray Owl taken in Salem.

CALDWELL, GEO., Ipswich, by Dr. PALMER. A collection of Stone Implements found in Ipswich.

CAPOLI, WM. A war club from the Fejee Islands.

CARLEN, S. Mergus serrator shot in South Salem. Mygale sp. from Salem.

CARLEN, S. and WATERS, D. P. Skull of a fox killed in Salem.

CHAPPEL, WM. Body of a Water Spaniel.

CLEAVES, NATHANIEL, Boston. An Elephant's Tooth, weighing thirteen and a quarter pounds.

CLOUGH, F. G., Warren, N. H. A specimen of Diapheromera sp. from Warren.

CLOUTMAN, WM. R., Charleston. S. C. A Stone Arrowhead from near Beaufort, S. C.

COLMAN, HENRY, Nahant. Seven Stone Arrowheads from Madison County, Miss. A vine embedded in Wood, and skin of the Summer Duck, from Madison County.

COLUMBIAN ASSOCIATES. Two Sioux Arrows from Fort Rice, Dakota Terr.

COOKE, C. A Stone Sinker from Little River, North Hampton, N. H. A string of Beads and a Human Tooth from Quincy, Mass. (Taken from an Indian grave). A specimen of Lepus Americanus from Salem. Fishes from Hanson's Mills, Danvers. Cicada septemdecem from Danvers. Parasites from Woodchuck, Hare, Wilson's Snipe and Salmo Sebago.

COOLEDGE, J. Japanese Paper Coat and a Japanese Tobacco Box.

COOLEDGE, J. T. A Snake from a ship from the East Indies.

CRESSY, N., Canaan, N. Y. A collection of Freshwater Shells.

DAVIS, HENRY, McGregor, Iowa. Three boxes of Fossils from Iowa. Specimens of Bufo sp., young, and Insects from McGregor.

DAVIS, H. C., Colorado. Fossil Wood and Limestone from Middle Park, Colorado.

DENSLOW, W. W., New York. Specimens of Xylocopa and their cells in wood.

EDMANDS, ALBERT W., Charlestown. Portion of a Stone Pestle found in North Chelsea.

EMERTON, J. H. Living pupæ of Ephydra sp. from brackish pools in the rocks at Marblehead.

EMMONS, Capt. GEO. F., U. S. Sloop of War, Ossipee. Gorgonia from the Gulf of Nicoya, Costa Rica.

FABENS, Capt. CHARLES. Skins of Loon and Velvet Duck. Portion of an Ant's nest from Surinam, S. A.

FARRINGTON, G. P. Gorgonia from Florida.

FELT, J. G. Minerals from Areath River, Greenland. Gold Quartz from Lisbon, N. H.

FELT, S. Q. A twig covered with a deposit of Lac from the East Indies.

FISH, W. C., Eastham. A living specimen of Aromochelys odoratum and one of Dendroica pinus, and Panopeus Sayi from Cape Cod.

FISK, Capt. J. B. A Harpoon head made by the natives of Behring's Straits. Two Fish-hooks from the Sandwich Islands. Bow and Arrows from the Aion Islands. An Arabic Charm and a Basket from an unknown locality, and the Skin of a Tropic Bird.

FLETCHER, SAMUEL, Middleton. Four Arrowheads and two Stone Gouges found on his farm at Middleton.

FOWLER, GEORGE. Echinus granulatus from Hampton Beach.

FULLER, CHARLES B., Portland, Me. Echinarachnius parma from North Carolina.

GAGE, JOHN, Middleton. Thirteen Arrowheads and two Stone Gouges found on his farm in Middleton.

GARLICK, Dr. T., Cleveland, Ohio. Head of a Rocky Mountain Antelope, female.

GOLDTHWAIT, J. A. Specimens of Agaricus sp. from Salem.

GOLDTHWAIT, J. A., NORRIS, C. H., MORSE, E. S., COOKE, C., PUTNAM, F. W., and others. Several Bone Implements and a collection of bones of various animals found in the Shellheaps at Eagle Hill, Ipswich.

GOODELL, A. C., Jr. Specimen of Dendroica pina from Danvers.

GOODHUE, SAMUEL V. Specimen of Anarrhichas vomerinus from Salem Harbor.

GOULD, JOHN, Ipswich. A Snowy Owl shot in Ipswich. Summer Ducks, male and female, from Wenham. Arrowheads from Wenham. A broken Stone Gouge, two Arrowheads and four other Stone Implements from Ipswich.

GRIFFEN, H. B. A fresh specimen of Auk from Salem Harbor, and a specimen of Ctenodiscus crispatus taken off Rockport.

GRIFFEN, E. and J. Three Monkeys from the West Coast of Africa, and the Carcass of a Water Buffalo from the Hooghly river.

GRIFFEN, JOHN. A fresh specimen of Crane from Alyoa Bay, South-east Coast of Africa, and the Antlers of an East Indian Elk.

HAM, ELIAS, Marblehead. Indian Implements found at Marblehead Neck.

HOWELL, ROBERT, Nichols, N. Y. Indian Implements found at Troy, N. Y., also Glacial Pebbles from same vicinity.

HOYT, Dr. A. B., Grafton, N. H. Specimen of Otus Wilsonianus and of Putorius Novæboracensis from Grafton, N. H.

HOYT, JOHN A., Georgetown, Mass. A White Rat from Georgetown.

JAQUES, D. H., New Jackson, Fla. Spanish Moss from Florida.

JEFFRIES, H. W., Manilla. Two specimens of Euplectella speciosa from the Island of Zebu.

JENKINS, STEUBEN, Wyoming, Pa. Two specimens of Puff-ball, Geaster sp., from the Banks of Breise's Creek, near Wyoming.

JELLY, Mrs. CHARLES. Weasel killed in Winthrop street, Salem.

JENKS, Prof. J. W. P., Middleboro'. Compound Ascidian from Neponset Beach.

JILLSON, S., Hudson. Nest of Marsh Wren from Hudson.

Johnson, F. D. Living specimen of Chelydra serpentina from Lynnfield.

Johnson, Wm. E., Newbury. Lithodes arctica from Massachusetts Bay.

Johnson, Wm. G., Rowley. Portion of an Indian Skeleton found in Rowley, and Six Eggs of the Night Heron from the same place.

Jones, Geo. W. A Shrew Mole and a specimen of Mergus serrator, both killed near Salem. Common Crow from this vicinity.

Jones, J. D. Specimens of Hawks shot in Salem.

Jones, Simon, Wenham. Head of a Martin, Mustela Americana, female, caught in Wenham.

Jordan, Michael. Common Brown Bat taken in Salem.

Ketchum, E. B., Albert Mines, N. B. Two Slabs containing Fossil Fishes from the Albert Mines.

King, Capt. Henry F. Tusks of a young Asiatic Elephant from Ceylon.

Kinsman, Nathaniel. Two specimens of Goniaster sp. from Trinidad, Cuba. Six Eggs of the Night Heron from Rowley.

Lee, L. T. A collection of Corals and two Clypeaster sp. from Tortugas, Fla.

Lewis, Dr. James, Mohawk, N. Y. Alcoholic specimens of Mollusks from Alabama.

Lowd, Joseph. Specimen of Mergulus Alle taken in Salem.

Lykens, W. H. R., Kansas City, Mo. A collection of Fossils from Kansas City.

McNeil, J. A., Grand Rapids, Mich. A large collection of Fresh-water and Land Shells from Michigan. Also portions of his Central American collection, not yet entered in detail.

Mead, S. B., Augusta, Ill. Specimens of Lithostrolion from Illinois.

Morse, E. S. Mounted specimens of Algæ from Portland and vicinity. Asterias Forbesii from Provincetown.

Morse, Mrs. E. S. Insects taken in Salem.

Nelson, Sylvanus A., Georgetown. Great Blue Heron from Georgetown. Eggs of the Black Snake. A Bat, species unknown, from Georgetown.

Nichols, W. F. Fossil Ferns and Minerals from Pa.

Norris, C. H. Surf Duck shot in Salem.

Norton, Edward, Farmington, Conn. A collection of Hymenoptera from various localities in the United States.

Nourse, Luther, Ipswich. Three Stone Arrowheads from Ipswich.

Packard, Capt. E. S., Rockland, Me. Several Fossil Bones and Sharks' Teeth from near Charleston, S. C.

Packard, Dr. A. S. A Stone Chisel found at Niagara Falls, and Injurious Insects from Salem.

Page, I. M. Head of a sixty pound Cod. Stomachs of Sand Dabs containing shells.

Palmer, Dr. Charles, Ipswich. Stone Implements from Ipswich.

Peabody, Wallace, Middleton. A Stone Gouge from that place.

Perkins, Dr. G. A. A Greegree or Charm from Sierra Leon, Africa. Shells from Salem Harbor. Corals from ——. Fire-flies from Cuba. Echinus granulatus from Salem.

Perkins, Capt. J. Warren. A fine specimen of Tubipora from Marquesas Islands.

Phelps, W. A., Middleton. Arrowheads from Middleton.

Pierce, B. O., Beverly. Snake from Port Elizabeth, Africa.

Pitts, Mr., Salem. Arvicola riparia from South Salem.

Price, A. E., Gloucester. Skull and Jaws of a Shark from Massachusetts Bay, and one from Georges' Bank.

Putnam, C. A. Sponge from Hanson's Mills, Danvers.

Putnam, E. & Co., Boston. Copper Ore from the Gertrude Mines, N. B.

PUTNAM. F. W. Limulus Polyphemus. Two Kittens with malformed feet.

QUIMBY, Dr. E. H. Fungi from a Plumtree.

RIVA, C. E., Wenham. Embryo Striped Snake.

ROBERTS, J. W. A Longicorn Beetle found in Salem.

RUSSELL, Rev. J. L. Specimens of Sedge, Cyperus sp., from Surinam, S. A.

SANBORN, FRANCIS G., Boston. Spiders from the White Mountains. Specimens of Lithosa casto.

SAVORY, T. T. Two living Woodchucks from New Hampshire.

SEARS, J. H., Danvers. Stone Arrowheads and two round Stone Implements from Danvers. Two eggs of Cat Bird, and Insects from Danvers.

SHEPARD, H. F. Minerals from Mineral Point, Wis. Insects from Grafton, N. H.

SHIMER, Dr. H., Illinois. Insects from Illinois.

SILSBEE, B. H. Insects from Rio Jaineiro, Brazil.

SILSBEE, W. H. Collyrio borealis from Beverly. Fishes from Salem Harbor, and Parasites of Fishes from this vicinity.

SMITH, G. D., Boston. Ffteen hundred specimens of named Coleoptera from North and South America.

SOUTHWICK, C. F., Peabody. Fox Squirrel from Ohio.

STEARNS, R. E. C., San Francisco, Cal. Birds, Reptiles, Fishes, Crustaceans, Mollusks, Radiates, Plants, and Skull of Sea Otter, all from California.

STEVENS, C. K., and **CHAMBERLAIN,** Boston. Fishes, Crustaceans, Mollusks and Worms, dredged in Massachusetts Bay.

STONE, Mrs. A. Providence, R. I. Spiders and Insects, from Providence.

STONE, WILLIAM, Ipswich. Bone Implements, pieces of Pottery and a number of Teeth and Bones of various animals from the Shellheaps at Ipswich.

SYMONDS, CHAS. N. Snow Bird taken in Salem.

TEAGUE, WM. Monkey from the West Coast of Africa.

THAYER, E. S. Palinurus perciformis taken at Salem.

THOMAS, Maj. **GEO.,** Middleton. A Stone Pestle from Middleton.

THURLOW, B. F., Newburyport. An Albino Haddock.

TRACY, C. M., Lynn. Eggs of Black Snake from Lynn.

TRUE, Dr. N. T., Bethel, Me. Two Rocks showing glacial action, from the Androscoggin Valley, Me. Spongilla from a pond near Webster, Me.

TUCKER, HORACE. A Quiver of Arrows, of North American Indians.

TUCKER, JONATHAN. Several Ethnological specimens.

UNKNOWN. A Goshawk from ———.

WALCOTT, C. F. Eggs of Tern from Salem Harbor.

WALKER, C. A. Fishes from South Pacific. English Cross-bill and Finch. Four specimens of the Least Tern and Eggs of Tern, from Cape Cod. Geode from Fejee Islands. Sixty Copper Coins. Chinese Seal taken at the Pillage of Chusan, and a seal made of a piece of Stalactite from St. Michael's Cave, Gibralter.

WATERS, D. P. Seven species of Essex County Birds.

WEST, W. S. Spider from Salem.

WESTERN, SAMUEL, Family of, Middleton. Twenty-five Arrowheads from near Middleton Pond, and Stone Implements from other parts of Middleton.

WHEELER, E. S., Savannah, Ga. Fossils, Shells, Insects, Reptiles and Birds from Savannah.

WILLARD, Capt. B. J., Portland, Me. Swordfish and Shark from Casco Bay.

WILLIAMS, I. P., Chelsea. Photograph of an Iron Fort, designed by him.

WYMAN, Prof. J., and Messrs. **PUTNAM, MORSE** and **COOKE.** Bones, Pottery and Bone Implements from the Shellheaps at Eagle Hill, Ipswich.

CALEB COOKE, *Assistant.*

REPORT OF MR. McNIEL ON HIS EXPEDITION TO CENTRAL AMERICA.

F. W. PUTNAM, *Director, Peabody Academy of Science:*

DEAR SIR:—In accordance with your request, I give herewith a report of my recent expedition to Central America. In order to be more fully understood, I have deemed it proper to begin with its inception, not yet one year ago.

In a former visit to the Pacific coast of Central America, about eighteen years since, I became satisfied that the coast presented a rich field of labor for the collector in Natural History and Archæology, and also that the fauna would prove to be different in many respects from that part of the country north of the Sierra Madre Mountains, or that bordering on the Caribbean Sea.

Having watched the direction of many expeditions to Central America and finding them all taking for their starting point some place on the Mosquito coast or Bay of Honduras, and scarcely ever penetrating as far as the summit of the mountains, gave me a strong desire to explore this neglected portion. Feeling the importance of encouraging words from some well established Scientific Institution in my own country to give character to such an expedition abroad, and as I could make no pretentions as a scientific collector, though I had paid some attention to the department of Mollusca, I was reluctant to ask any one to advance funds in aid of such an expedition, and the misfortunes of the past few years had so reduced my own ready means, that some sacrifices were necessary in order to accomplish my object. The funds secured, I wrote to several parties and institutions on the subject. Your friendly reply, coming more promptly and to the point than others soon led to an understanding between us which resulted in my leaving New York on the 23d day of May last for the Pacific.

In New York I met with much kindly aid and assistance from those excellent gentleman, Thos. Bland and Geo. N. Lawrence, Esq's, who gave much of their valuable time to expedite my outfit. To Mr. J. F. Joy, Secretary of the Panama Railroad Company, who, unsolicited, secured me a free pass on their Railroad, and line of Steamships on the Pacific coast of Central America, I am especially indebted.

The voyage to Aspinwall was short and pleasant, and I arrived there June 1st, and spent one day. Here Wm. Parker, Superintendent of the Panama Railroad, gave me a pass over the Railroad, including a recommendation to the hospitalities of the station masters along the line of the road. Arriving at Panama, Mr. Wm. Nelson, Agent of the Company, tendered me any assistance I might require in furtherance of my object during my residence in that vicinity. The yellow fever prevailing here to a considerable extent, I took the first opportunity to leave for Nicaragua, and left Panama, June 11th, on the Steamer Guatemala, Capt. A. T. Douglass, who, with his officers and men, treated me with such uniform kindness that I must place this as one of the pleasantest trips of my wandering experience. The next morning after leaving Panama, we passed the large island of Quibo on our right, and two smaller ones on our left (Hickoron' and Hickorita). I have passed these islands several times before, and have long had a strong desire to visit them for the purpose of collecting, having never been able to learn that any Naturalist has been there. Viewed from the sea, their rich forests and sheltered reefs give great promise of rich results to the collector.

June 16th we arrived in the Bay of Realejo, Occidental Department of Nicaragua. This port still bears that name, but the small town of recent growth at the landing, is called Corinto. Realejo being about seven miles north and above ship navigation.

At Corinto I found the U. S. Sloop of War Ossipee, Capt. (now Commodore) F. W. Emmons, who, with his officers, treated me with great kindness, and rendered much assistance in the way of boats and other facilities, for the examination of the waters of this vicinity. Here the difficulty of getting my alcohol through the Custom House (the article being contraband), prevented me from saving but comparatively few specimens, though they were to be had in abundance. The state of the weather rendered it impracticable to make any extended trips, and the shoals and reefs not being very rich in Mollusks or Crustaceans, not requiring alcohol, I was confined to the collection of such specimens as were least abundant.

July 16th, after remaining at Corinto one month, I moved about twenty miles inland, in the direction of Leon, to the Hacienda of Don Ycidro Ycaza, known as "Corcuera." Here I was cordially received and treated with much kindness by Don Ycidro during my stay of about four weeks. The manner of living was quite primitive, but the success I had in collecting caused me to overlook or forget these little peculiarities. From the river at this place (at *this* point, called Rio Gigilillo, and pronounced *Hehelelio*), I obtained several hundred small Unios which I believe to be of a new species. These were by no means abundant, and I found it necessary to employ the natives to aid me in collecting them. I also obtained a large number of fine Melanians, which I found in great abundance. In the ditches used for irrigating the cane fields, I found a goodly number of small shells — Amnicola, Physa, Planorbis, &c.

At Corcuera I also collected several species of land shells, fishes, crustaceans, reptiles and insects; among the latter were about three thousand Butterflies.* The natives — men, women and children —

ranging through fields, woods and streams, to secure for me the desired objects, and for *themselves* the desired "plata," as a compensation. From this place I made a trip to Leon to procure bottles or cans for alcoholic specimens, but with little success. Determining to change my quarters about the middle of August, I sent the material collected at Corcuera, to Corinto, and went down myself to procure a suitable package in which to ship them. This I found was quite difficult to obtain, but finally accomplishing it I made my first shipment. I then returned inland, and accepted the invitation of Messrs. J. J. & F. B. DeShon, who own about forty thousand acres of land which joins Corcuera on the west. The "Haciendas" are separated by about six miles of forest. That of Messrs. DeShon, is known as "Hacienda de Polvon," and is situated upon the same river (or brook, as it would be called in New England) as Corcuera. This river is here called the "Polvon." This is the way streams are named in this Country; each locality giving them a different name. I did not expect much difference in the nature or character of my collections, but as the Messrs. DeShon were natives of New London, Conn., I had reasons to hope that my stay with them would prove of great advantage in my work. I was here furnished with a room admirably adapted for the purpose of receiving and caring for the specimens that I was daily receiving from the natives, and the kindness of the Messrs. DeShon was unceasing. I was constantly being made to feel very much at home; horses were at my disposal to ride where I wished; carts were promptly furnished, when I wished to send down to the port for shipment. And for all this I was not permitted to make any remuneration.

While at Polvon, besides collecting a number of specimens of reptiles, fishes, insects, land and fresh-water shells, crustaceans, etc, I obtained much valuable information which I trust will be useful in my future explorations in the country. This information more particularly relates to what is known in reference to the Archæology of the district.

About the middle of September, I went with Don Ycidro Ycaza, about sixty miles north of Leon, to visit a gold mine belonging to him. This trip took me to the Estero Real, which flows into the south arm of the Gulf of Fonseca. From this river I obtained a few hundred small Unios, but being unprepared for general collecting, I got but little more at this point. The information gained while on this trip will more than compensate for the time (eight days) spent. About twenty miles north of Leon we crossed a fine valley, which, from the vague information I was able to gather from the natives, was once inhabited by a race of people quite unknown to the present inhabitants. This locality presents sufficient attraction for farther investigation, which I hope in the course of a few months to give. Information gained from various sources while in this country leads me to anticipate rich results from a thorough search for Archæological remains in the Occidental Department of Nicaragua. And I am assured of the aid of several intelligent gentlemen, both native and American residents, in furtherance of this object.

The prospects for obtaining marine specimens, now that I am prepared to save them in the cans and bottles already forwarded by the Academy, are very flattering. Fishes, crustaceans, radiates, mollusks, etc., are in sufficient abundance.

I have an abundance of work laid out for execution on my return. Should some of this not prove as productive as anticipated, the rich Gulf of Fonseca is within a few hours sail and I can try that. The numerous streams which fall into this gulf, the fine valleys, together with the islands and reefs, have long been attracting me in that direction. But every additional day's stay in one locality, proves to me most conclusively that in order to do justice to any locality, the most active collector requires *time*. I am satisfied that a stay of a day or two in one place is not sufficient to develop the riches it may contain.

The results of my *first* visit are now before you, and are, I doubt not, ere this in a condition to be catalogued. And as a beginning, I trust they are not altogether unsatisfactory. Though I confess my main reliance is in the way I have opened for future explorations, which I hope soon to enter upon.

I remain, respectfully, yours, etc.,

JOHN A. MCNIEL.

December 8, 1868.

PROPOSED PLAN OF OPERATIONS.

THE Director and Curators of the Academy, in offering the following Plan of Operations for the approval of the Council and transmission to the Trustees, are fully aware that their first duty is the arrangement of the Museum; but experience in this and several kindred institutions, has shown them that even this cannot be effectively done without the aid of some established principles. And, it may be added, that without such a standard of reference for the decision of all cases which may arise, an institution cannot be sure of that singleness of purpose in the minds of its officers, which secures the ready and unobstructed execution of its designs.

The difficulty of providing a well considered plan, comprehensive in its principles, and simple and unmistakable in its details, is increased by our existing relations with the Essex Institute and the East India Marine Society.

The Academy began its career in a large and active sphere of influence already prepared by these institutions. With the Natural History Museum of the Essex Institute was received a scientific reputation which the honor of the Academy is concerned in maintaining. The many valuable memoirs published in the "Proceedings of the Essex Institute;" the popular papers, meetings and lectures, which were all begun and carried on for the same purposes as those expressed in Mr. Peabody's "Instrument of Trust," and which are still in active operation, either under the auspices of the Academy or with the participation of its officers, are responsibilities which the experience of the past year has shown the necessity of continuing and developing in order to meet the just expectations of the public.

The *future* work of the Academy has been rendered doubly effective by the wise forethought of Mr. Peabody, in making the arrangement of the collections the first object to be accomplished by the Trustees. But the union of the two museums has mapped out a course leading to greater results, and has shown the need of larger means for their support than was anticipated, even by those previously associated in their management. It is evident, therefore, that the plan of operations must be limited in this respect also, and be confined not only to those duties which are a necessary development of what has preceded, but to those which demand the least pecuniary outlay.

The fundamental principles of the "Instrument of Trust" are "the promotion of the Study and Knowledge of the Natural and Physical Sciences," "and of their application to the Useful Arts." How these principles should be interpreted and adapted to the purposes of the Academy, was left to the judgment of the Trustees, and they are the standard by which the fitness of every undertaking must be determined. The first recommendation of any scheme, therefore, is its application of these principles, restricted, however, at present, to the immediate wants of the officers in arranging the Museum, and other obligatory duties, having in view the general objects of the trust.

With regard to the promotion of the study of the sciences, the plan should take advantage of the efficient machinery of the educational system, the Normal School and the High Schools. Courses of lectures have been given at different times within the past years, to the pupils of these schools, and therefore they come within the category of the obligatory duties referred to above.

For the promotion of the knowledge of the sciences, the best possible foundation is in the Museum, which is capable of being developed into a medium of popular education, with a power and influence that can hardly be overrated; other means, second only to this, may be found in the popular lectures, the scientific publications and the *American Naturalist*.

With regard to the Museum, it may be further remarked, that the true policy of the Academy is to coöperate with other establishments of a similar kind in neighboring cities, and thus help to perfect the grand group of scientific institutions in the eastern part of Massachusetts. The Academy should by no means permit a spirit of rivalry, but in all cases aid in completing the apparatus of education, by developing those departments which supply the deficiencies in other Museums; make full and complete collections only so far as regards Essex County, and confine the general Museum to educational and typical collections.

The application of the sciences to the useful arts should be governed by the same principle of coöperation, and then it becomes evident that the path which accords best with the objects of the Academy is one not yet occupied. The Massachusetts Institute of Technology, located in Boston, is devoted solely to the education of pupils in the application of the sciences to the arts. The well appointed laboratories and the learned instructors possessed by that Institute and the Lawrence Scientific School at Cambridge, render it wholly unnecessary, if it were practicable, to attempt a similar career.

The importance of this provision in the "Instrument of Trust," is not, however, impaired by these facts; on the contrary, it opens to the Academy a path leading to results of equal merit, and, perhaps, of even greater benefit to the people of Essex County; namely, the sustained prosecution of a Survey which shall place within the reach of every citizen constant means of information with regard to any facts of which he may desire a scientific explanation, and, also, eventually complete an illustrated handbook of the natural resources of the County, compiled from the essays and maps published by the Academy. As a contribution of science to the arts, it would be in great part unique, and its prospective value may be partially estimated by the fact, that comparatively little is now known of the natural resources of any County in the State. This Survey, so far as the Natural Sciences are concerned, has already been partly accomplished, and considerable material has been published. The officers in arranging and completing the Essex County collection must necessarily make progress in this direction, and their observations would begin the work of fulfilling this important provision of the trust.

To carry on the arrangement of the Museum effectively, it is essential to have a working library; in fact the need of one has already become a matter of serious inconvenience.

Much could be effected by exchanging copies of the *Memoirs* and *American Naturalist* for scientific publications; but eventually means sufficient to buy such books of reference as cannot be thus obtained will be necessary. At present this want is in part supplied by the private libraries of the officers and the library of the Essex Institute, but these are insufficient.

With these explanatory remarks the following plan is presented for the consideration of the Council, premising, however, that it is brought forward only as a provisional measure greatly needed by the executive department of the Academy, and that in its preparation the experience of the Smithsonian Institution, which has done more than any other to promote the diffusion of scientific knowledge in America, has been taken as a guide so far as it could be consistently followed.

GOVERNING PRINCIPLES OF THE PLAN.

1. The fund is given "for the promotion among the inhabitants of the County of Essex, of the Study and Knowledge of the Natural and Physical Sciences and of their application to the Useful Arts."

2. The "Instrument of Trust" has thus defined three distinct objects: — the aid to be afforded to students of the Sciences; the aid to be offered to all in the pursuit of a knowledge of science; and the advancement of the material prosperity of the County, by the application of Science to practical purposes.

3. A museum is essential to the development of such a plan, especially in spreading a knowledge of science among the people, and this is recognized in the terms of the trust.

4. A working library is needed for the practical execution of the plan, and the collection of the necessary books should be an object of the first importance.

5. The main purpose of the trust is to benefit the people of the

County of Essex, and, therefore, this localization should be prominently recognized in all the operations of the Academy.

6. Every scientific institution, however, either from its geographical position, or some inherent peculiarity of its organization, must have certain connections with other domestic or foreign institutions, or individuals engaged in the pursuit of knowledge. Therefore it is necessary to define these connections, that they may be used for the general benefit of Science without interfering with the special objects of the trust.

7. Economy, and the belief that gratuitous lectures or instruction, with certain exceptions, do not lead to the best results, demand that the services of the officers should be charged for at certain nominal prices to be determined as occasion requires.

DETAILS OF THE PLAN.

SECTION I.

"To promote the study of the Natural and Physical Sciences," it is proposed to offer inducements to teachers and scholars to enter upon the special study of the Sciences.

The practical execution of this would be as follows:—To give courses of lectures to the Normal School as often as practicable; to give courses of lectures of a strictly educational character to teachers, persons interested in Science, and select classes of students combined in different parts of the county; to distribute collections properly named, labelled and mounted, to the schools, suitable for the practical illustration of text-books and lectures, provided the School Committee or others receiving them will agree to preserve and use the same for the benefit of students, or return them without unnecessary delay to the Academy; to afford to all special students who manifest an earnest desire to study science, the opportunity of doing so free of charge for tuition.

SECTION II.

"To promote a knowledge of the Sciences among the people," it is proposed to give courses of lectures to public audiences; to give practical discourses of a conversational and informal character, at certain hours, in the halls of the Academy, illustrating them with the collections; to print catalogues of the collections, which shall be abbreviated text-books of the different departments, and convey to the visitor lessons upon the principles which have governed their arrangement; to print one general catalogue on the same plan, which shall be compiled from the others, but illustrated by a separate collection in the Museum; to sell these catalogues at as low a price as possible; to encourage the formation of scientific associations for the promotion of knowledge, by giving collections, properly labelled and arranged, provided the recipients agree to furnish proper cases, make them the nuclei of local collections, and use them for the benefit of the public, or return them without unnecessary delay to the Academy; to provide inexpensive means of communication for investigators in distant parts of this country, and in Europe, for the transportation, exchange, and purchase of books and instruments of a scientific character; to encourage any worthy publication of a scientific character, which may be issued within the limits of the County.

SECTION III.

To promote the "application of the Natural and Physical Sciences to the Useful Arts" it is proposed to organize a systematic survey of the County, and, that the means of accomplishing it may be provided, it is recommended that every salaried officer and special student of the Academy be required to study some scientific subject of local application, and contribute his knowledge in a written communication for the use of the Survey; that these communications be published, whenever practicable by the Academy, under the general title of "The Annals of the Scientific Survey of Essex County"; that all explorations and investigations upon local subjects of a worthy character be encouraged, and, if of sufficient importance, published in the "Annals."

SECTION IV.

The Museum should possess the fullest attainable collection, illustrating the Natural and Physical History of the County, and should convey reliable information of the fauna and flora, the mineralogy, the geology and topography, illustrating the latter, if necessary, by maps and casts in relief.

In order to make the general collection of the Museum of the greatest educational and practical value, it is proposed to exhibit only series of typical species, so that each group will form a distinct picture, and avoid the usual practice of crowding the cases with specimens; to store all specimens which do not further the main object of the collections (the illustrating of the published catalogues), in drawers or other repositories, where they should be thoroughly arranged and available for study, but not for general exhibition.

The funds specially devoted to the Museum should be appropriated annually for specific purposes.

SECTION V.

To obtain a full set of works which would facilitate the arrangement and use of the collections, it is proposed to exchange with other societies and institutions issuing works of a scientific character; to purchase, when the funds justify the expenditure, such books and pamphlets as may be from time to time needed by the officers of the Museum in the arrangement of the collections; to catalogue and arrange the books and pamphlets in a suitable manner.

SECTION VI.

The geographical position of the Academy, and its natural advantages, impose upon its officers certain duties to Science. These are, to supply institutions and individuals situated in the interior with typical collections of native products, especially the marine animals and plants, properly named and labelled; to regard these collections as exchanges, and a means of completing and increasing the Museum, but to give them freely as donations, whenever, in the judgment of the Council, it may be for the benefit of Science to make the exception.

REPORTS

OF THE

FINANCE AND EXECUTIVE COMMITTEES.

REPORT OF THE FINANCE COMMITTEE.*

The Finance Committee submit a report for the year ending January 15th, 1869.

On the fourteenth day of March, 1867, the Trustees received from Mr. George Peabody the sum of $140 000 in money and bonds. The Finance Committee, in whose charge it was placed by the Trustee, immediately set apart the sum of $100 000, as provided in the Instrument of Trust, and caused the same to be invested as the Permanent Fund. Changes have been made in these investments from time to time, which it is unnecessary to enumerate here. The Committee thought it proper at this time to make a new valuation of the property so held in the "Permanent Fund." In doing this they have given a low valuation, charging the bonds, at par where their market value is above par, or at cost. It is as follows:

PERMANENT FUND.

27 000 Mass. Bonds, 1883, 5 per cent.,	$27 000.
10 000 " " 1894, 5 per cent.,	10 000.
29 000 10-40 U. S. Bonds, 5 per cent.,	29 000.
10 000 Indianapolis and Vincennes Bonds, guar'd 7 per ct.,	8 500.
King Building,	22 000.
Hubon House,	3 500.
	$100 000

The Committee estimate that we shall receive during the ensuing year a net income from the "Permanent Fund" of $7 788. Another source of income which the Academy has to rely upon is the rents from the Marine Hall, viz: of the store, $500, and the banking rooms, now under a ten year's lease, at $400, to the Naumkeag Bank, which expires Oct. 1, 1869. The rent from the Banking rooms will be raised on the expiration of the lease. The Committee consider that we cannot expect to receive from this source more than $1 000 during the coming year, deducting the taxes which we are obliged to pay on this portion of the building, the Committee place the net income at $900 from Marine Hall. This added to the income from the permanent fund, would make an estimated income of $8 688.

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* Owing to the absence of the Treasurer this report has been prepared by the Finance Committee.

There is also loaned to the *American Naturalist*, the sum of $4 000; this loan was made by vote of the Trustees, from a sum which was set apart as a building fund from the forty thousand dollars originally given, a part of which was to be used in erecting buildings. It is secured by a transfer of the plates and property of the Magazine, and the income therefrom is $280 a year. It was the original intention of the Trustees that this fund should accumulate until, from this and other sources, a sum sufficient should be obtained to erect the buildings necessary for the Institution. If under the necessities of the year it should be considered best to devote it to current expenses it would add $280 to our income, and bring the total income we can expect from all sources to the sum of $8 968. The cash on hand, $528.32, which appears in the statement of receipts and expenditures below, would make the total sum available, $9 496.32.

The outstanding indebtedness at the present time, for expenses during the last four months of 1868, as yet unadjusted, amounts to the sum of $3 600, which must be met by the income and funds available as before recited for 1869, thereby reducing our actual means for 1869 to $5 888.32, or it may be met by a temporary loan. This matter is especially called to the attention of the Trustees.

The income received since March, 1867, from all the sources above named, has amounted to the sum of $14 455.43, which, added to the sum authorized to be expended under the Instrument of Trust, for the purchase and addition to buildings and the preparation of the Museum, has placed in our hands the sum of $54 412.46. The following exhibits the expenditures of this sum:—

Cash on hand March 14th, 1867, ...	$26 559.04
13 000 10-40 U. S. Bonds sold, ...	13 397.99
Income from March 14, 1867, to Jan. 15, 1869, .	14 455.43
	$54 412.46

Marine Building and Museum, including land adjoining, purchase of lease, &c., ...	$20 090.10
Construction, ...	15 847.05
Museum, ...	10 976.41
Loan to Naturalist, ...	4 000.00
Essex Institute, ...	500.00
Insurance on Marine Building and Investments, .	626.88
Burglar Proof Safe, ...	105.55
Repairs on Hubon House, ...	240.03
Taxes, ...	317.25
Watchman, ...	297.37
Treasurer's Clerk, ...	350.00
Expense of Trustees, ...	185.15
Incidental expenses, ...	348.35
Cash on hand, ...	528.32
	$54 412.46

In preparing this statement the Committee thought it unnecessary to go into greater detail, as the books of the Treasurer will exhibit all the items if any desire to examine them. The original purchase of Marine Hall, for $15 000, and of the land adjoining for $3 900, together with expenses incidental to the purchase and the buying out of a lease upon the premises, carried the cost of the buildings and land as it came into our hands, to $20 090.10.

The expenses upon the building and Museum have been divided into two accounts, the Construction and Museum. The Construction account includes all the expenditures made in the remodelling of the Hall and building, in constructing the cases and conveniences necessary for the exhibition of the collections and providing for the officers employed; it also includes a considerable expenditure made in rendering the building secure against fire by placing iron shutters on the side windows, covering the eaves with iron, and building the walls to the roof. The Museum account includes the expenditure made upon the collection itself, the salaries of the officers employed in its arrangement, the mounting, preparing, labelling, and cataloguing of specimens, with all the attendant expenditure for alcohol, bottles, boxes, etc., essential and necessary in a Museum. The other items are given in detail, because they do not properly come under either of the other heads.

It is believed by the Committee that although the money used exceeded the original estimates, for reasons which will more fully appear elsewhere, yet that which has been accomplished could not have been done for less, and no more has been done than the magnitude and value of the collections placed in our hands require.

The Construction account will soon be closed, and it is presumed that the expenditure will, during the ensuing year, be confined to the arrangement of the Museum. As these expenditures are capable of a comparatively accurate estimate in the various departments, and the amounts that will be required by the several officers in charge of the duty of arranging the Museum can be determined, it is suggested by the Committee that the Trustees should decide what sum they will devote to the purpose, and then make specific appropriations for the several departments and the special matters for which expenditure will be required. The expenditures to be limited strictly to the appropriations.

It is also suggested that for the better organization of the financial department, that upon the approval of bills for salaries and other expenses, by the proper officers and committees, that a pay roll shall be prepared, and each bill shall be receipted for by the person to whom it is due upon payment by the Clerk of the Treasurer.

The Committee cannot close their report without making a suggestion in regard to the establishment, at an early day, of a guarantee or contingent fund which shall secure us from any diminution of the Principal Fund, and also provide for its gradual enlargement. In a great and benificent charity like this, which is intended to be perpetual, a small annual increase to the permanent fund will, in the lapse of years, form a large sum and be of the greatest service in promoting the objects of the Trust.

There are two methods by which this can be accomplished. First, by reserving a certain percentage upon the income of all or of certain investments; as, if the Trustees should determine that four per cent. upon the net income should be reserved to form such a fund, thus upon an income of $8 000, $320 would each year pass into the contingent fund; or secondly, that a limit should be put to the appropriation of income from particular investments, the balance to pass into the contingent fund; thus of the income from Government stocks, six per cent. should be the limit, and the percentage over six should go to the contingent fund. United States and Massachusetts fives are now yielding us about six and three-fourths per cent. If the Trustees should decide that only six per cent. should be used in the current expenses of the year, three-fourths per cent. would go to the fund, and on our present investment of $66 000, $420 would go to the contingent fund from that source each year. This last method might yield a very large or a very small sum. It would have the advantage of increasing our reserve when our income is largest, and not crippling our means when our percentage is six per cent. or less. It would give us the same amount for expenditure each year, and a fluctuating increase; the first would give us a fluctuating sum to be expended according to the prosperity of each year, and a certain increase. Whether we can at this time, and in our present necessity, establish either of these plans, is for the Trustees to determine, but your Committee are of the opinion that one or the other should be adopted at the earliest practicable moment.

Wm. C. Endicott, Geo. Peabody Russell, S. Endicott Peabody,	*Finance Committee.*

REPORT OF THE EXECUTIVE COMMITTEE.

The Executive Committee, in submitting their First Annual Report have thought proper briefly to review the whole period of the Trust, and to offer a few suggestions in regard to its future policy and management.

Upon the acceptance of the Trust from Mr. Peabody, the Trustees purchased the East India Marine Hall, with the land adjoining, and at once entered into agreements with the East India Marine Society* and the Essex Institute,† for the deposit and care of their large collections. To carry out the objects of the Trust, and to fulfil their agreements, it was necessary to change and rebuild entirely the interior of the Hall, and to employ a large force to prepare and classify the collections for proper exhibition. The details of these arrangements will be found in the various reports forming the Annual Report of the Council.

This, the first work named in the Instrument of Trust, the furnishing and arrangement of a Museum for the benefit and instruction of the public, has from that time been steadily prosecuted. Our progress has not been as rapid as we originally hoped and believed it would be, but we have proceeded as rapidly as circumstances and a proper regard for the character of the work would allow. It was thought by the Trustees at the beginning that, according to the design and language of Mr. Peabody, the Museum should be not only a source of amusement and general interest to the public, but also that it should be so scientifically arranged that it would furnish instruction to the pupil and the student; in other words that it should be a Museum peculiarly fitted to furnish reliable information to the student in those branches of Natural and Physical Science alluded to in the Instrument of Trust, and also that it should be largely devoted to the collection of objects in these branches relating to, or connected with, the County of Essex.

The character, abilities and acquirements of the gentlemen employed for this work, are such as to insure, we believe, the final and complete accomplishment of this portion of our design. The funds originally proposed to be allotted to this work amounted to $20000, and it was then supposed that a year, perhaps eighteen months, would be necessary for its completion. The erection of the buildings, proposep in the Instrument of Trust, was necessarily deferred till the completion of the Museum, and it was thought that when that time came we should have from the income of the fund a sufficient sum to insure their commencement and the prosecution of our work in that direction. But the eighteen months has more than passed, the Museum is not completed, and the time for entering upon the erection of buildings and the other objects contemplated by Mr. Peabody, has not yet arrived. A larger outlay has been required than was at first thought to be necessary, and our resources are inadequate, for the present, to carry out all the objects intrusted to us, within the period first proposed.

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*See p. 8. †See p. 14.

The principal reason for this state of things arises from the magnitude and value of the collections received by us under the agreements from the East India Marine Society and the Essex Institute. Not only did all the collections of these two societies, which they had on exhibition, come to us, but also large stores from the Institute, which, packed away in cases, have been accumulating for many years. All these collections were known to be valuable and extensive, but how valuable and extensive was not known till placed in the hands of men of science, for examination and arrangement. In addition the specimens which have poured in upon us directly, and have been since received under an agreement with the Institute, have far exceeded the original calculations. We may safely say that the collections for which we have been called to find room, are double the size originally supposed, and in the present hall a large portion of them cannot be put on exhibition. The objects of the Trust, the agreements entered into, the public benefit and instruction require that everything should yield to the formation of a proper Museum, such a Museum as will be an honor to its founder and the County which he intended to aid and advance by the diffusion of science and knowledge among its people.

The room which these additions called for has increased the cost of our alterations, while the time required for their arrangement, and the general enlargement of our plans, have largely increased our general expenditure. Our plans have been necessarily extended rather than materially changed, and they will take further and larger means than was originally expected. But in establishing an institution like this it is better to lay the foundation strong and durable, and while delay may be annoying and full of disappointment, when measured by the perpetuity of the institution, a year or more is but of trifling importance. If we had the necessary means to accomplish all that has been cast upon us — the erection of buildings, containing lecture rooms, laboratories, etc. — we might go on with the other work, but for the present that is not practicable. For the completion of the Museum and for the erection of the buildings we may apply the income from the fund; and not until these objects are accomplished can we devote our funds or our efforts to the departments, especially of physical and natural science, in the proportions mentioned in the Instrument of Trust. Our duty then for the present must still be confined to the completion of the Museum. Nor can we well say when it will be completed—not that we can hope to say literally at any time that it is done—but when it will be in such condition as to fulfil the general requirements for which it is intended. That it may be opened to the public, and that it may be formally dedicated during the coming summer, we have reason to think probable. But even then there will be much to be done that will require all our resources, certainly through the coming year.

But while our expenditures are necessarily confined to the Museum, the Trustees have not been unmindful of the future that is before them, and they have felt the necessity of, in some degree, shaping, and, as far as possible, inaugurating a policy which shall carry out the objects of the Trust. The end which an institution like this has in view can be stated generally and without difficulty—the diffusion of science and knowledge in this community and through the County of Essex. But what especially shall be diffused, and how it shall be done, are questions not so easily answered. And yet upon the answer the success of the institution may depend, and the Instrument of Trust leaves that to be decided by the Trustees.

The Trustees were early of opinion that an Act of Incorporation was necessary for the perfect development of any definite plan of operations. The Act* incorporating the Trustees of the Peabody Academy of Science is all that could be desired. The terms are entirely consistent with the Instrument of Trust, and in addition give to the Trustees large and specific powers to hold other funds upon the same trusts or upon special trusts not inconsistent with Mr. Peabody's instrument. After the acceptance of this act, and the organization of the Trustees under the same, it seemed proper and necessary that some special body should be established to which the Trustees should delegate certain ministerial and executive duties relating to the practical administration of the affairs of the Academy. The By-laws† of the Trustees, by which a Council is established, and the Rules and Regulations‡ of the Council, state the organization and define the duties of that body. This Council, uniting a certain number of the Trustees with the Director and the Curators associated with him in the arrangement of the Museum, gives us an efficient organization for the work which is now in progress and which may hereafter be undertaken.

As we have stated, the completion of the Museum is the first and main object now, but the Trustees were of opinion that it would be wise to begin upon a small scale what at some time we hope to do on a large and extended scale. We therefore made provision for lectures and also for the publication of papers, strictly scientific, to be denominated the *Memoirs of the Peabody Academy of Science.* Under these provisions a course of lectures is now being given by Messrs. Putnam, Morse and Hyatt, and it is hoped that we may commence another season with a course of lectures to be delivered by the above named gentlemen, assisted by some of the Trustees, in various portions of the County. These may be regarded as the commencement of a series of lectures, regular and systematic, which will be one of the chief instrumentalities for the diffusion of that knowledge which Mr. Peabody intended to afford to the County of Essex. These lectures must be given chiefly in the Rooms and the Halls of the Academy, when furnished, but at stated periods they should be delivered in the several cities and towns of the County, and before various local societies, schools or classes.

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* See p. 25. † See p. 27. ‡ See p. 31.

And here it may be remarked that lectures affording solid instruction in an agreeable and interesting way, are much needed in this community. The persons, who for the most part supply the popular lecture platforms, are either professional lecturers, given to sensational declamatory fine writing, gentlemen of some general reputation obtained in other fields, or the advocates of some particular hobby or reform. Lectures are given and attended, not for instruction and improvement but to gratify curiosity or to afford amusement and excitement to audiences. The result is that the lecture now seldom instructs. Aiming at other ends the modest rewards of the scholar and man of science are no longer the measure of payment, and prices have risen to an exorbitant rate. Lecturers swell their incomes by a winter's tour at one or two hundred dollars a night. They are paid as opera singers are paid. The lecture platform is thus forced to pay a heavy tribute, and in the smaller towns and communities the performance is beyond the reach of the people. It would be idle, even if it were desirable, to attempt a change in this condition of things, or to enter into a crusade against the present system, but it would seem that much might be done in this County, by an institution like this, coöperating with local societies, to furnish that which the Lyceums no longer supply.

The publication of scientific papers is also provided for in the By-laws. The importance of this it is not necessary to discuss, and it is hoped that the Memoir, about to be published, will be the first of a series which will render a large service to the cause of science.

To furnish instruction in the sciences by a well arranged Museum, by lectures to pupils, classes and communities, by publications of a scientific character, would seem to be the best means to carry out the objects of the Trust. Nor should it be forgotten that a select library of reference would be the necessary adjunct to such a general scheme. How far and when we shall be able to accomplish these things the future must determine, but our efforts should be directed to these ends, and not be wasted on any smaller schemes.

To accomplish these ends, we shall require buildings upon the land adjacent to our Hall, which will give additional accommodations to our Museum and afford lecture and working rooms. The wise forethought of our late President, by the purchase of the Hubon estate and other land adjacent to the Hall, has given us most ample space for enlargement, and the buildings can be arranged in a manner both convenient and effective.

But after we have adopted this general plan, with the buildings and the means necessary for its execution, we are still met with the question, in what way through your Museum, lectures and publications directed by an efficient and accomplished corps of teachers, can you best carry out the objects of the trust? Will you have merely the general object of diffusing knowledge, or will you unite that to special methods and purposes suited to this locality, and having in view the County of Essex and its people especially.

When we consider that we inherited and succeeded to the large collections of two well organized local societies, having not only a local but a wide extended reputation, it would seem as if certain special duties were marked out for us by circumstances, not generally falling upon new institutions of this kind. And when we also consider that Mr. Peabody made his generous endowment that he might do something to perpetuate the good name of the County of Essex, and to promote among her inhabitants the study of the sciences and their application to the useful arts, it would seem that the course to be adopted, and the instruction to be furnished, should have especial reference to the County itself and the people. To combine these objects with the broad, comprehensive and catholic spirit, which should pervade all educational institutions, would seem to be the problem to be solved, and the true field for our labor. While the time has not come for this to be actually done, it seems to the Executive Committee that the time has come for some plan to be shadowed forth which shall, to a certain extent, indicate a course to be pursued and the instruments by which it is to be done. Such a plan must be at this time of necessity somewhat general, lacking in specific and definite detail essential to the practical working of any plan.

But if we can have a general plan before us which shall unite in a practical way these general and local objects, and by which we can diffuse instruction and knowledge relating to this locality and time, and also to all places and time, we shall have attained all we can now attain. We shall inform the public what may be expected, and solicit their coöperation; we shall have a clear path to tread without being confused by those constantly recurring indecisions and uncertainties which too often attend new undertakings. To know what you want and intend to do is nearly allied to doing it.

This has been accomplished already in the Museum by having specific collections arranged by themselves, illustrating the fauna, flora, and geology of the County of Essex. While the subject has received the attention and been much discussed by the Trustees, it was also one of the first subjects considered by the Council upon its organization in October last. The result has been that a plan, drawn up by Mr. Hyatt for the Director and Curators, was approved by the Council. This will appear with the papers sent up to the Trustees by that body. The Executive Committee would commend this plan to the thoughtful consideration of the Trustees. It is drawn with care, and seems to your Committee to evince sound judgment and a full appreciation of the duties which devolve upon us. Without enumerating or commenting upon its details, which are somewhat elaborate and are worthy of especial perusal, we wish to call particular attention to two of its suggestions: the prosecution of a survey of the County of Essex; and the arrangement and depositing of scientific collections with schools or societies in the County, under certain conditions and restrictions. This last would seem to be a most efficient method of at once gratifying the curiosity and stimulating the zeal of those who take an interest in such matters, wherever these collections are placed; and it would also enable the Academy to reach a large number of persons who could not visit the general museum or attend upon public lectures: while a survey of the County, giving an accurate account of its resources, illustrated by hand-books and maps, would be of great practical value to the public; a contribution, as is well stated, of science to the arts, in great part unique and unequalled. While the paper is, properly speaking, no part of the Report of the Council, we would recommend its publication in the Annual Report of the Trustees.*

We cannot refrain, in this connection, from bearing testimony to the ability and learning with which Mr. Putnam and his associates, Messrs. Hyatt, Morse and Packard are performing their duties. We consider that we are peculiarly fortunate in having secured their services; that we may be able to retain them permanently, we think of the first importance to the welfare of the Academy. The plan proposed has their full approval, and if eventually adopted, and our means are sufficient for its prosecution, we think they are, of all persons, the best fitted to insure and make certain its success.

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* See p. 86.

The circumstances, under which the *American Naturalist* became connected with the Academy, may be found in the report of the meeting of January 14th, 1868. The loan that was made to it at that time, and which is stated in the Finance Report, is believed to be well secured, and the Academy is in no sense liable for its pecuniary obligations. It has been of the greatest service, by its exchanges, in forming the nucleus of a library, and it has been the means of adding largely to our collections from all parts of the country and the world. It affords a vehicle of communication with the scientific world, such as we believe no other society possesses, and gives us great facilities and opportunities, which have been improved to the utmost by the editors in charge. It is believed that its assistance will do much to promote and advance the general as well as special objects of the trust, and will have a large influence in instructing the people in the natural sciences.

In closing their Report, the Executive Committee are prompted, alike by duty and inclination, to speak of the great loss which the Academy has sustained in the death of its late President, Mr. Francis Peabody. The very elaborate memorial of him, prepared by Mr. Upham, delivered before the Essex Institute, of which Society he was President, and by them published, leaves little to be said in regard to his life, character, or works. It is rare, indeed, that so much can be said of one to whom the pursuits of science were rather the resource and delight of leisure hours than the beaten track of professional toil. He was deeply interested in this institution; he did much to establish and form it; he sought its success earnestly and laboriously even to the injury of his health, and perhaps the shortening of his life. And if the Peabody Academy of Science shall realize to the people of the County of Essex all that its munificent founder intended, and take that place among the scientific institutions of the country that we hope it may, the name of its first President will be remembered as chief among those who have borne an honored part in the work.

For the Executive Committee,

WILLIAM C. ENDICOTT.

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SECOND AND THIRD

ANNUAL REPORTS

OF

THE TRUSTEES

OF THE

PEABODY ACADEMY OF SCIENCE,

FOR THE YEARS 1869 AND 1870.

PEABODY ACADEMY OF SCIENCE.
ORGANIZED. A.D. 1868.

SALEM:
PRINTED FOR THE ACADEMY.
1871.

PRINTED AT THE SALEM PRESS.
F. W. PUTNAM, *Proprietor*.

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TRUSTEES AND OFFICERS OF THE ACADEMY

FOR THE YEAR 1871.

TRUSTEES.

Asa Gray, Cambridge, Mass.
William C. Endicott, Salem, Mass.
G. Peabody Russell, Salem, Mass.
Othniel C. Marsh, New Haven, Conn.
Henry Wheatland, Salem, Mass.
Abner C. Goodell, Jr., Salem, Mass.
James R. Nichols, Haverhill, Mass.
Henry C. Perkins, Newburyport, Mass.
S. Endicott Peabody, Salem, Mass.

Finance Committee. — Messrs. Endicott, Nichols, and Goodell.

Executive Committee. — Messrs. Endicott, Wheatland, Goodell, Nichols and Perkins.

OFFICERS.

President. — W. C. Endicott.
Vice President. — Henry Wheatland.
Secretary of the Trustees. — A. C. Goodell, Jr.
Treasurer. — J. R. Nichols.
Director of the Museum. — F. W. Putnam.
Secretary of the Council. — A. S. Packard, Jr.
Curators. — A. S. Packard, Jr. and E. S. Morse.
Assistant. — Caleb Cooke.
Director's Clerk. — W. S. West.
Treasurer's Clerk. — B. W. Russell.

COUNCIL.

The Council consists of the President, Vice President, Secretary of the Trustees, Treasurer, Director, and the Curators.

SECOND ANNUAL REPORT

OF THE

PEABODY ACADEMY OF SCIENCE,

FOR THE YEAR 1869.

SATURDAY, JUNE 5, 1869.

THE Trustees met this day according to notice duly given at the request of the President.—Present, Messrs. Endicott, Wheatland, Perkins and Nichols.

Messrs. Nichols and Wheatland were appointed a committee with full powers to arrange an order of exercises for the dedication of the Museum of the Academy to take place on Wednesday, August 18, 1869, and to report the same at the July meeting. The President was subsequently added to the above Committee.

SATURDAY, JULY 3, 1869.

Agreeably to notice the Trustees, by invitation of Dr. James R. Nichols, met at his cottage on the border of the beautiful Kenoza Lake in Haverhill.—Present, Messrs. Endicott, Wheatland, Marsh, Nichols, Goodell and Peabody.

The following votes were adopted,—

Voted, That Messrs. Wheatland and Nichols be authorized to carry out the plan of proceedings at the dedication of the Museum on Wednesday, August 18, substantially as reported at the meeting.

Voted, That the thanks of the Trustees be tendered to the author for a copy of a beautifully illustrated work in one volume folio, from the New York press in 1865, entitled "A Monograph of the Tetraoninæ, or family of the Grouse, by Daniel Giraud Elliot, F.R.S."

Voted, That the Secretary be instructed to acknowledge, by letter to the Mayor, the courtesy of the City Government of Salem, in detailing an officer to attend at the Museum on four days of each week.

DEDICATION OF THE MUSEUM.

WEDNESDAY, AUGUST 18, 1869.

THE various alterations and improvements in the East India Marine Hall, which were necessary to accommodate the large and valuable collections intrusted to the care of the Academy by the Essex Institute and the East India Marine Society, having been completed, the occasion of the Annual Meeting of the American Association for the Advancement of Science — this year held at Salem — was taken to dedicate the Museum to the uses for which it was designed by its founder.

The preliminary exercises were held at the Museum. The chairman of the Committee of the Trustees, Dr. HENRY WHEATLAND, called the assembly to order, and addressed William C. Endicott, Esq., President of the Academy, as follows:

Mr. President: — This day we meet, in the presence of this assemblage, comprising many citizens of the County of Essex, members and friends of our various local organizations, and a large body of the representative men of science in this country, to dedicate this Museum to the uses indicated in the instrument creating this trust. It is sincerely regretted by all that the infirm health of our generous patron prevents his attendance on this occasion as we had so fondly expected a few weeks since; an occasion of great interest to him, commemorating an important step in the accomplishment of one of his long cherished plans. A brief statement of the doings of the trustees, committees and others relating to the work of arrangement may be appropriately alluded to in this connection.

The first duty of the trustees after organization was the purchase of the East India Marine Hall and land adjoining, and the receiving on permanent deposit the valuable museum of the East India Marine Society. The second, the arrangement of details for the deposit of the scientific collections of the Essex Institute.

These preliminaries having been satisfactorily adjusted with the several parties, the finance committee was directed to superintend the alterations in the hall and the erection of cases and galleries in accordance with plans that had been submitted to the approval of the trustees. The principal part of the collection of the East India Marine Society was packed away in boxes and stored in a temporary structure in the centre of the hall, some of the most valuable specimens were deposited in the vaults of the Naumkeag National and the Salem National Banks, and in other safe places. To the officers of the Banks thanks are due for their kindness at that time.

The work has progressed with all convenient despatch; more was required to be done than was anticipated; universal satisfaction has been expressed in the general design and execution. Many of the specimens have been placed in these cases, and an arrangement has been made sufficient for all practical purposes in opening the Museum to the public. It will undoubtedly require considerable time before the specimens can be labelled and properly catalogued. In fact, this can never be done, as the daily contributions forbid a completion of this work. Insufficiency of accommodations prevents the exhibition of many specimens which for the present are placed in trays and deposited in the basement. To Messrs. Putnam, Hyatt, Packard, Morse and Cooke, credit is due for what has thus far been done in this arrangement. To you, as President of the Trustees, I transfer this Museum: its condition you and all present can determine. May the plans mapped out for its future growth and usefulness be fully realized, and may the liberal benefactor never have cause of regret in founding this institution for the promotion of science and useful knowledge in the County of Essex.

Mr. **Endicott** in accepting the building in behalf of the trustees, and delivering the custody of the Museum to the director, spoke as follows:—

In behalf of the trustees I accept the work that has been prosecuted under the direction of your committee, indeed I ought to say, under your direction, for to your services on that committee we are chiefly indebted for the result. And I desire here to express to you the deep sense of obligation that we all feel to you personally. Your untiring zeal, ready knowledge, and constant devotion, have made you a most important member of this board. And if this Museum accomplishes its purpose, to no one will the public and the cause of science in this vicinity be more indebted than to you.

It only remains for me, in obedience to the direction of the trustees, to deliver to you, Mr. Putnam, as director of the museum, the hall and all that it contains, to be cared for by you and those associated with you. In doing this, we desire to say to you that we fully appreciate the services you have thus far rendered, and repose entire confidence in your ability to perform this important trust. We gratefully recognize the efforts you have made to build up here an active institution of science, and to collect here a corps of active and zealous laborers in the same field. You and your associates have the entire good will of the Board of Trustees, and their earnest wishes that you may succeed in so establishing the Peabody Academy that it will be an honor to its founder and a benefit to those for whom it was founded.

Mr. F. W. **Putnam**, in accepting the trust, responded as follows:—

Mr. President and Gentlemen, Trustees of the Peabody Academy of Science:—I thank you for the honor you have conferred upon me by this public confirmation of my appointment as Director of the Museum of the Academy. I can assure you, gentlemen, that in accepting the charge of this valuable museum, which I do with a full appreciation of its responsibilities, I shall strive to the fullest extent of my energy and ability to make the museum an honor to the name which it bears, and an exponent of the objects of your trust; and while supported as I now am by the confidence of your board, and the devoted corps of fellow officers, I feel that success can but attend our united efforts.

At the close of Mr. Putnam's remarks Mr. Endicott announced that the Museum was henceforward open to the public. The audience then adjourned to the Tabernacle Church on Washington street where the dedicatory services were continued. The seats in the body of the house were reserved for invited guests, including the members of the Association for the Advancement of Science. The other seats in the church were occupied by the citizens generally, who were present in large numbers.

The exercises were resumed in the church at three o'clock with prayer by the pastor, Rev. CHARLES R. PALMER. The following hymn, written for the occasion by Rev. JONES VERY, of Salem, was sung by a select choir of the Salem Oratorio Society: —

THE noble hall our fathers planned,
  Where gathered were the rich and rare
From every clime and every land,
  And long preserved with faithful care;

To Science now we dedicate,
  That doth all Nature's realms explore;
New ways through continents create,
  And cables stretch from shore to shore.

And higher still, on soaring wing,
  The great Creative Thought would find;
And study, in each living thing,
  The end for which it was designed.

That it may serve the lot of man,
  And to the race a blessing prove;
Unfold the universal plan
  Of God's beneficence and love.

Honor to him, who, far and wide,
  For these high ends his wealth bestows;
Which, like some mighty river's tide,
  Through all our land exhaustless flows.

ADDRESS BY WILLIAM C. ENDICOTT, ESQ.,

PRESIDENT OF THE ACADEMY.

We open to-day the Museum of the Peabody Academy of Science, and dedicate it to the high purpose intended by its founder — the benefit and instruction of the public. And while as the Museum of the Peabody Academy, its career now commences, and its work has just begun, we cannot fail to remember that this Museum has a history of its own already, which runs back to the commencement of the present century.

It indeed owes its present form, arrangement, completeness, and the excellencies that spring from these, and all its promise of future usefulness, to the wise and bountiful munificence of Mr. Peabody. But that its rich material was at hand, awaiting the touch of his bounty, that such a Museum was to-day possible we are indebted to the past, and to the wise and thoughtful labor, through many years, of other workers in the cause of science. And in dedicating this present work to the public, in speaking of its character and capacity for usefulness, we would do full justice both to the past and the present; we would speak of what has been done, and by whom, as well as of that which is now in progress or may hereafter be accomplished.

In the year 1799, the Salem East India Marine Society was founded, and in 1801 obtained its act of incorporation. It was an association of masters and supercargoes of vessels belonging to Salem. No one could be a member who had not doubled one of the two great capes, — the Cape of Good Hope or Cape Horn, — either as master in charge of a merchantman, or as factor in charge of a cargo. This was a somewhat exclusive provision, for to have commanded on the tempestuous Atlantic, or on the Spanish Main, or in the great Mediterranean, the terror of whose waves Virgil has described in his most sounding lines, such services gave no claims to membership. Only those who in charge of the most costly ventures and the best appointed ships, and had sailed in the most distant seas, came within the provision. There was a certain largeness of thought in this exclusion, as if to secure excellence, by reason of wide experience in important trusts; and it indicates the character and extent of that India trade which from this vicinity, and in those early days, could erect a large and powerful society on that basis.

The original objects of the society evinced a broad and liberal spirit. While the good fellowship and sociability, and the bond of a common pursuit, united them firmly together, the first definite object of the institution was benevolence and charity. Its funds were devoted to the relief of disabled seamen and to the assistance of needy members and their families. Its second was the collection, by members upon their voyages, of facts and observations for mutual instruction and improvement, and for the security of navigation. These facts and observations noted in journals were deposited with the society, and open to public inspection. And in addition to these two objects, not a part of either, or growing strictly out of either, but coming from the taste, character and thought of the individuals themselves, their love of the instructive, the beautiful, the rare, they collected curiosities from the strange and distant seas they visited.

All things in those days, from China, Sumatra, India, and in a later period of their commerce, from the Islands of the Pacific, were interesting, and with these they filled their rooms; and to-day they have a great value not to the curious alone, or the many seeking amusement, but to the student in ethnology and general science. Here can he read the testimony of the rocks, the growth of tropical forests, the secrets of tropical seas, and the strange animal and vegetable life that filled them. Here can he study the habits, tastes, characters; can see the weapons, utensils, costumes, ornaments of strange and distant peoples, and of some tribes and races which have either been trodden out, or whose modes of life have disappeared in the presence of the white man. Large sums were often expended, and great risks incurred in obtaining objects for this collection; small at first, it in time became a museum, to which the public were admitted without charge, to which the man of science could repair for instruction, and which had a national reputation. But times and the methods of business changed. The wharves that welcomed the richly-laden Indiaman became deserted, the homeward bound sought larger marts. The India trade, an adventurous and almost romantic chapter in the history of Salem, was drawing to its close. The active members of the society who could fill its cases and adorn its walls became fewer in number. The class in this vicinity, from which their ranks were recruited, diminished, and as the prospect of still further reduction was certain, the question became urgent, who in the end would care for and sustain the museum. The society might have prolonged its life by changing its rule of membership, but true to the spirit of their fathers, and the heroism of their calling, they preferred to go down with the flag nailed to the mast, if they could but find a good ship, trusty and true, to take their cargo on board. Such a good ship was at hand, and the Peabody Academy of Science will keep forever, with tender care, the collections of the East India Marine Society.

The old society will, I trust, yet have its historian who will tell its story at greater length than I have or can. But I cannot refrain from adding a word as we leave it. I know of no other instance of a society thus organized, entering so zealously and successfully upon the formation of a free museum for public instruction and improvement; filling it with objects of interest in nature, science and art; exhibiting a refined and sensitive taste, a large and various knowledge, a wise forethought and a public spirit which does it infinite honor. They were a remarkable body of men, educated not in the schools and universities, but by the rough experiences of the ocean, by foreign intercourse, by large adventures and weighty responsibilities. Commerce being the chief pursuit of the place it enlisted at an early age the most energetic and vigorous youth, and the best brains of this community commanded on the quarter-decks of its Indiamen. Nor were they distinguished in their calling and their business alone: one of their number became famous in science; many found their way into public office in the State and nation; and the names of members of Congress, secretaries of the navy, and a senator of the United States are borne upon their rolls.

Organized later, in 1833, and upon a different principle, was the Essex County Natural History Society. It proposed and commenced the formation of a museum of natural history, with especial reference to a complete collection illustrative of the natural history and natural productions of the County of Essex. Subsequently this society, united with the Essex Historical Society, was incorporated as the Essex Institute in 1848. It is only necessary to allude to the career of the Essex Institute. It has a well-known written history of its own, embodied in full records and proceedings, to be found on the shelves of scientific and historical libraries at home and abroad. It has its own historians within its ranks; men of science, men of letters, and scholars who give their time and talents to its service.

Pursuing at once the study of history and the natural sciences, endowed as it was with the collections in both departments of the societies of which it was formed, the Institute, after nearly twenty years, had collected in the department of natural history a large amount of material, illustrative not merely of the County of Essex, but of all the branches of natural science. A considerable part of this was on exhibition; a still larger portion, which was rapidly increasing, there was neither the room to exhibit, nor the means properly to arrange; and with the Institute the question also became urgent, what should be done with this valuable and increasing collection?

It was in this condition of these two societies that Mr. George Peabody, on his visit to America in 1867, established a trust, which he liberally endowed with the sum of $140,000 for the "promotion among the inhabitants of my native county of the study and knowledge of the natural and physical sciences, and their application to the useful arts," and he expresses the hope that this endowment may "tend to advancement in intelligence and virtue, not only in our good old County of Essex, but in our Commonwealth and in our common country."

Thus he established a new independent institution for the benefit and instruction of the people of his native county, — local in its original purpose and in the motive which prompted it, but he recognized in it and intended it should possess the broadest capabilities for the increase and diffusion of knowledge.

In establishing this trust, and in the practical and comprehensive directions which he gave to his trustees, Mr. Peabody manifested that large judgment and wise appreciation which has distinguished all his donations. Nor is his taste less conspicuous than his judgment; for each place and people he seems to do the right thing and always to meet a general and popular want. To one who had made his home and fortune in the great capital of England, what more fitting expression of his gratitude and benevolence than his gift to the never-ending procession of the poor of London? To one who felt a deep interest in the future of the Southern people, what better could he have done for them, or how more wisely could he have met their necessities than by his princely donation for the purposes of education? To one who, tenderly remembering the place of his birth, wishes at once to express his feeling, and to benefit those among whom he was born, how appropriate the foundation of those twin institutions reared upon the soil of his native Danvers, in one of which he has deposited the splendid gifts whereby great societies, communities and nations have sought to do him honor!

He desired to do something for his native County of Essex, "remembering," as he says, "her ancient reputation, her many illustrious statesmen, jurists, and men of science; her distinguished record from the earliest days of our country's history, and the distinction so long retained by her as eminent in the education and morality of her citizens."

And again he consults the needs, the circumstances, the opportunities of the place and time. Recognizing the fact that already there had been developed here a love for the pursuits of science, stimulated by the great opportunities of those two collections, and by the recent efforts and researches of the members of the Essex Institute especially, he determined that he could do most in the direction of the sciences, and with a keen eye to practical results he added their application to the useful arts. The field had been opened, the laborers were at hand, and he gave the means whereby the harvest could in time be gathered, and something be done by him to perpetuate the good name of the County of Essex, and to aid, through her, in the diffusion of science and knowledge. To have endowed one of these societies would have lost the collections and influences of the other; to have endowed both would have been unwise; to endow a new institution with authority to obtain the collections of the old, and to give it other and larger powers, to create something broader than either had been or could be, this was his choice. In the instrument of trust he empowered his trustees to purchase the hall containing the Museum of the East India Marine Society, and to enter into such arrangements with the Essex Institute as might be necessary to carry out the provisions of the trust. The hall was purchased, the trustees by written agreements took upon special and perpetual deposit the Museum of the East India Marine Society and all the scientific collections of the Essex Institute. Great changes were made in the hall and its appointments; two years have been passed in arranging and classifying the collections, that they may be not only interesting and attractive to the public, but instructive to the general student in science: and to-day we formally open the Museum, one step completed in the plan of Mr. Peabody. How it has been done it is for the men of science, so many of whom are here, to determine.*

The Museum has been arranged under the direction of Mr. Frederick W. Putnam as director, assisted by Messrs.

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* See note on page 45.

Alpheus Hyatt, Edward S. Morse, Alpheus S. Packard, jr., and Caleb Cooke. Whatever of merit its arrangement may possess is due to them, and what deficiencies may be apparent are owing to circumstances beyond their control, rather than to any want of zeal or ability on their part.

Of course it would be impossible, and by no means desirable, to recite what the museum contains, or the particulars of its arrangement. Three general objects were steadily kept in view.

First, The formation of a complete collection of the fauna, flora, geology and mineralogy of the County of Essex, so that all can have the means of becoming acquainted with the various objects of nature to be found on every hand. Great progress had already been made in this direction by the Essex Institute, and the western gallery is devoted to all the specimens now in possession of the Academy found in the County of Essex.

Second, To complete, as far as practicable the noble beginning already made by the East India Marine Society, of a collection illustrative of the habits and customs of the various tribes and natives living beyond the Cape of Good Hope and Cape Horn, with whom the founders of that society carried on so large a trade; and also to preserve as far as possible the remembrance of that trade and the society itself, by models of the vessels employed and by a collection of portraits of those who either as owners or navigators were its pioneers. To these collections the eastern side of the hall is devoted, and large additions have also been made to them by the Academy, relating to the aborigines of North America, especially those who lived in this neighborhood.

Third, The arrangement of the general collection upon the simplest possible plan, that of bringing together the different divisions according to their structural affinities. This arrangement is intended to be limited, for the present certainly, to the wants of the public and the general student; in other words, to be such a display of typical specimens, that every intelligent visitor may find the means of investigating the more general laws which govern the natural affinities of animals, plants and minerals. In the accomplishment of this purpose it was thought proper to suppress all useless details. Information in regard to the minor points of structure, which can only be conveyed by a large number of closely allied forms, is of no value to the general observer. On the contrary it tends to confuse and distract attention from general principles, and concentrate it on questions of limited application, of no practical importance, except to the special student. We are aware that the difficulties in the way of this arrangement are by no means confined to the selection of suitable specimens or their disposal in regular order. When placed in their most perfect condition, classified and labelled according to their different relations to each other, or to the circumstances of their geographical or geological distribution, they still are but dumb illustrations of the laws of nature. They are indeed the best possible illustrations, and rank next to the living facts in exactitude and truthfulness, but still they are only the illustrations of the book of nature, of which the text-book is still unwritten. To complete the plan therefore, and make the Museum all that it should be, catalogues are needed, which shall be to some extent abbreviated text-books; and it is believed by the gentlemen in charge of the Museum that they can be so made that any one desirous of information in regard to either of the groups of the three kingdoms may find not only a statement of the laws of its classification, but objects so prepared and arranged as to readily afford the information desired. Such is the plan upon which the Museum has been arranged. We cannot say that it is yet fully completed, but we trust it may in some degree meet the requirements for which it is intended.

While the completion of the Museum has been the main object thus far, the trustees were of opinion that it would be wise to begin at once upon a small scale what at some time we hope to do on a large and extended scale. Provision was therefore made in our by-laws for lectures and also for the publication of papers strictly scientific, to be called the *Memoirs of the Peabody Academy of Science.* One paper has already been published, which we trust will be the first of a continuous series. One course of lectures has been given by Messrs. Putnam, Morse and Hyatt, and it is hoped that we may commence another season with a course of lectures to be delivered by the above named gentlemen, assisted by some of the trustees in various portions of the county. These may be regarded as the commencement of a series of lectures, regular and systematic, which will be one of the chief instrumentalities for the diffusion of that knowledge which Mr. Peabody intended to afford to the County of Essex. These lectures must be given chiefly in the rooms and the halls of the Academy when furnished, but at stated periods they should be delivered in the several cities and towns of the county, and before various local societies, schools and classes. And here it may be remarked that lectures, affording solid instruction in an agreeable and interesting way, are much needed in this community. The persons who for the most part supply the popular lecture platforms are either professional lecturers, given to sensational declamatory fine writing—gentlemen of some general reputation obtained in other fields—or the advocates of some particular hobby or reform. Lectures are given and attended, not for instruction and improvement, but to gratify curiosity, or to afford amusement or excitement to audiences. The result is, that the lecture now seldom instructs. Aiming at other ends the modest rewards of the scholar and man of science are no longer the measure of payment, and the prices have risen to an exorbitant rate. Lecturers swell their incomes by a winter's tour at one or two hundred dollars a night. They are paid as opera singers are paid. The lecture platform is thus forced to pay a heavy tribute, and in the smaller towns and communities the performance is beyond the reach of the people. It would be idle, even if it were desirable, to attempt a change in this condition of things, or to enter into a crusade against the present system, but it would seem that much might be done in this county by an institution like this, coöperating with local societies, to furnish that which the lyceums no longer supply.

But the formation of a museum, which is the first and most definite object named in the instrument of trust, constitutes but a part of Mr. Peabody's scheme. After it is finished, and such buildings as may be required are completed, the income is to be devoted in certain proportions to the departments of the physical and natural sciences. In what way this shall be done the instrument does not state. It is left in the fullest manner to the discretion of the trustees.

In the early stages of an institution it is somewhat difficult to lay down a definite plan of operations; certainly it would be unwise to encumber ourselves with any inflexible formula of action or management. Circumstances may change, or our means may be insufficient. In stating, therefore, the purposes of the trustees, I state that which now seems to them most desirable, and the best method, in connection with the Museum, of promoting, to use the precise words of the trust, "among the inhabitants of the County of Essex, the study and knowledge of the natural and physical sciences, and their application to the useful arts."

These words clearly define three distinct objects. The aid to be afforded to the student of the sciences. The aid to all in the pursuit of a knowledge of the sciences. The advancement of the material prosperity of the county by the application of science to practical purposes. Having these objects in view, the following plan is proposed:—

1. "To promote the study of the natural and physical sciences" it is proposed to offer inducements to teachers and scholars to enter upon the special study of the sciences.

The practical execution of this would be as follows:—To give courses of lectures to the Normal School as often as practicable; to give courses of lectures of a strictly educational character to teachers, persons interested in science, and select classes of students combined in different parts of the county; to distribute collections properly named, labelled and mounted, to the schools, suitable for the practical illustration of text-books and lectures, provided the school committee or others receiving them will agree to preserve and use the same for the benefit of students, or return them without unnecessary delay to the Academy; to afford to all special students, who manifest an earnest desire to study science, the opportunity of doing so free of charge for tuition.

2. "To promote a knowledge of the sciences among the people" it is proposed to give courses of lectures to public audiences; to give practical discourses of a conversational and informal character, at certain hours in the halls of the Academy, illustrating them with the collections; to print catalogues of the collections, which shall be abbreviated text-books of the different departments, and convey to the visitor lessons upon the principles which have governed their arrangement; to print one general catalogue on the same plan, which shall be compiled from the others, but illustrated by a separate collection in the Museum; to sell these catalogues at as low a price as possible; to encourage the formation of scientific associations for the promotion of knowledge, by giving collections, properly labelled and arranged, provided the recipients agree to furnish proper cases, make them the basis of local collections and use them for the benefit of the public, or return them without unnecessary delay to the Academy; to provide inexpensive means of communication for investigators in distant parts of this country and in Europe, for the transportation, exchange and purchase of books and instruments of a scientific character; to encourage any worthy publication of a scientific character which may be issued within the limits of the county.

3. To promote the "application of the natural and physical sciences to the useful arts" it is proposed to organize a systematic survey of the county, and, that the means of accomplishing it may be provided, it is recommended that every salaried officer and special student of the Academy be required to study some scientific subject of local application, and contribute his knowledge in a written communication for the use of the survey; that these communications be published, whenever practicable, by the Academy, under the general title of *The Annals of the Scientific Survey of Essex County;* that all explorations and investigations upon local subjects of a worthy

character be encouraged, and, if of sufficient importance, published in the *Annals*.

In addition it is proposed to obtain by exchange with other societies and institutions, issuing works of a scientific character, such works as will facilitate the arrangement and use of the collections; to purchase, when the funds justify the expenditure, such books and pamphlets as may be from time to time needed by officers of the Museum in the arrangement of the collections. The geographical position of the Academy and its natural advantages, impose upon its officers certain duties to science. These are, — to supply institutions and individuals, situated in the interior, with typical collections of native products, especially the marine animals and plants, properly named and labelled; to regard these collections as exchanges, and a means of completing and increasing the Museum, but to give them freely as donations, whenever it may be for the benefit of science to make the exception.

Such is the Museum we to-day dedicate; such the general plans and views of those intrusted with its management. That such a plan is practicable, and would result in promoting in this vicinity the study and knowledge of the sciences, and their application to the useful arts, we have no question. How far we shall be able to carry it out, and whether we can with our present means accomplish more than a part (of that there can be no doubt), the future must determine.

It is hoped that there will be the necessary zeal and fidelity among its officers to accomplish what has been undertaken. It is also hoped that, in view of the great importance of scientific study in these days, an institution thus endowed will not be permitted to languish. However this may be, in establishing a new institution which is to outlast generations of men, upon which large duties are imposed, with great ends to be accomplished, it would seem to be wise to determine just what is needed and then how best it can be done, and having determined this, to carry out as much as possible; and what cannot be done to-day, prepare to do, hope to do, to-morrow. Keeping your object steadily in view, bending all efforts in that direction, some time and at last the object will be gained. We therefore look forward hopefully, confidently, to the future. This Academy, we trust and believe, will last with the County of Essex. And we also believe that, under honest and faithful management, strength will be given it to accomplish all that Mr. Peabody designed and intended by founding so beneficent a charity. Identified as it is with the spirit of the time, and the interests of this people, it would seem that it must partake of their good fortune and prosperity. For the part which the study of science and its application to the arts is now playing in the world cannot fail to strike even the unthinking; to appreciate the part it is destined to play in the future needs almost the aid of the imagination. That its influence upon general education will be immense and constantly increasing, no one can doubt. Upon this question there has been much recent controversy between those who in the field of education expect too much from the study of science, and those who fail to see enough. The man of science on the one side often sees, or thinks he sees, a revolution in the methods of teaching the young and in the training of the mind; the man of the classics often looks upon it as an intruder, come to jostle out of place some essential portion of his curriculum; and while on both sides much is said that is true, there is also much said that is utterly untrue.

That there is to be a new education in any sense that looks to the abandonment of the old, that will turn its back on the old method as upon an exploded practice, as doctors have abandoned bleeding, and priests persecution, is neither desirable nor possible. Those systems of culture that, known as academical culture, are especially devoted to the training of the mind, can never be abandoned. While imparting as much knowledge as is consistent with proper training, knowledge is not so much their object as to make the mind strong by discipline; to put the man in full possession of himself, able to grapple with great truths and with the work of life. Not only is this power more valuable than mere knowledge, but without it knowledge is valueless. A club which the arm is not strong enough to wield is useless for attack or defence. The man must first be taught to think before he can feel the force of truth, or wisely receive the thoughts of others. This training gives power, dexterity and skill in intellectual action. For all the higher pursuits of life it is essential where great results are to be obtained and great things achieved. Some strong, vigorous minds reach that discipline of themselves which the university tries to give, but these are the exceptions, the monuments to tell us, not that academical training is needless, but that some men are strong enough to obtain its results elsewhere.

This training of the mind is a thing by itself; it gives the power to acquire knowledge, whether in science, law or philosophy, and whatever may be the progress of science, probably no better substitute will be found. It is not by destroying or impairing one system of education that we are to make room for another, but by adding what the times and the progress of knowledge demand. In this regard there is no difficulty with the pupils. The boy of to-day has learned a hundred facts and essential things, which the boy of fifty years ago did not, could not know, yet it was as difficult to be a good scholar then as now, and with all our progress it is no easier now than then. If the educators cannot happily unite and blend the two, it would seem as if the progress of knowledge had failed to reach them. For when we consider the great impulse of late years given to science, what it has done and must do, how it is advancing and adorning our civilization, aiding man and bringing each day some new power of the material world under his control, it would be idle to say that any general system of education is perfect which does not keep pace with this progress, or that any one could be well educated from whom a general knowledge of the sciences is withheld.

Especially is this true now, for the application of science to the arts holds such a place that it may be said to mark, to characterize, the age itself.

As we look back through history, we are struck with the fact how, in particular periods, and in particular countries, the activities of the human intellect, roused into enthusiastic action, have spent themselves in particular directions. Consider the preëminence of Greece, think how the activities of her intellect poured their full volume through all the avenues of the beautiful, touched all the departments of thought, and sounded all the depths of passion; her statues and architecture which still mock the hand of artist and architect alike; her poetry and eloquence, which no succeeding age has surpassed; her heroism in arms; her philosophy which knocked loudly at the portals of that infinite mystery which the man of Nazareth proclaimed. The splendid spectacle passed away never to reappear. Turn to the Crusades, how all that was noble in the civilization of that day banded together for the rescue of Jerusalem; a period of intense enthusiasm, of romantic adventure, of religious fervor, and of martial splendor. Consider the great awakening of the human mind after the sleep of the middle ages. Observe the splendid cities that it founded, the arts it brought to life, the fetters of error and superstition that it broke, the revival of learning, of letters, of art that attended it. Turn to the period of the reformation, its later fruit, which dividing the Christian world, exhausted all the energies of the human intellect and all the resources of kingdoms. Consider the zeal and fervor which marked the period of the discovery of America; when the veil was lifted from continents, and islands, and seas, and new heavens and a new earth were given to man. Particular channels of thought, a particular work to do, particular objects, hopes, aims, all-absorbing and intense, mark all the periods of history worthy to have lived in.

This is preëminently the age of scientific discovery. Onward it moves with a spirit as dauntless and enthusiastic as that which carried the powers of the West to the gates of Jerusalem, with a confidence as absolute and complete as that which led the great discoverer to the shores of America. We who live in the midst of passing events hardly realize the wonders which science has achieved during the last thirty years. Upon its banners are inscribed the names of victories which have revolutionized the habits, thoughts, business of the world. Their enumeration is unnecessary, their names rise upon the memory and the lips; the man who has not reached middle life can remember their announcement, and may live to see results flow from them as wonderful as the victories themselves. The glorious prophecy of the *New Atlantis*, wherein the great English philosopher pictured in vision the results to be anticipated from the study of natural history through successive generations, is more than fulfilled, and the vision is cold beside the present realities.

And yet the field is as boundless as when Bacon surveyed it. The horizon of knowledge still flies before us as we advance, alluring and beckoning on the student. The largest problems await solution; even now the most gifted minds are bending all their energies to questions the importance of which can with difficulty be stated — the origin and diversity of races, the antiquity of man, the origin and limitation of species — questions that involve the largest capacity, requiring at once the most minute investigation, the clearest, most exhaustive processes of reasoning and analysis, and the largest grasp, and may need at times a flight of the imagination like that which enabled Goethe to evolve from a broken skull one of the broadest generalizations in animal structure. Every discovery into the laws of nature and the properties of matter has started questions yet unanswered, and opened new avenues of research. Battery after battery is taken only to find another frowning beyond. Great as man's discoveries have been they have dealt only with the properties of matter; the essence still eludes his grasp, and the laws of the mind itself are unknown. We have touched but the outward shell of things, but each day adds something. The great conflict between man and the mysteries of nature will have its battles lost, its battles won, we hope, its final triumph; and that some future generation of the race may in the fulness of time stand before the last great mysteries which it is not permitted for man to fathom or the eye of flesh to behold.

Certainly no time could be more opportune for the establishment of an institution like this in a community largely imbued with love of these pursuits. An institution not intended for general education, but to aid the general and special student in the study of the sciences. That it is capable of accomplishing a large good would seem to be self-evident. It will bring to the knowledge of the people of this country facts valuable to their prosperity and development, and perhaps valuable to the world at large. More and greater than that, it will afford opportunities to all, especially the young and inquiring; the seed may fall on good ground, some gifted mind may thus find the field for its career. Quickened and inspired, the bent of genius may be changed and some great master in natural or experimental science may be given to the world, who will extend the domain of man over matter and reflect something upon the ancient reputation of the County of Essex, of which Mr. Peabody speaks with so much pride and feeling in his letters to his trustees.

Of him I had intended to say something. It would seem natural to speak of him here; of his large benevolence, of his wise foresight, of that wonderful spectacle he presents — a man in his lifetime widely dispensing millions, the executor of his own will and bounty — of that rare felicity of his fortune whereby his name will be linked forever to the cause of education and the progress of knowledge, and will be remembered in academies and schools, and the halls of science, and the hearts of a grateful and instructed people, when the praise of Princes and the thanks of Congress are forgotten, and their gifts have crumbled into dust. But what can we say? except to tell what he has done, and that the world knows by heart! Washington needs no man's eulogy to tell us what he did for his country, and our great philanthropist needs no words of mine to delineate his character or to tell the long story of his benefactions. His name is added, and added in his lifetime, to the short but immortal list of those whose place is settled by the universal assent of mankind.

We had hoped to have had him with us to-day, but in a distant State he seeks the restoration of his health. You will join with me in the hope that time will bring healing on its wings, and that he may long be spared to his country and the world. We again thank him for this institution; we again pledge ourselves, and those who shall succeed us, to the faithful carrying out of the letter and the spirit of his trust, and we declare in the words of Bacon, that

"The end of its foundation is the knowledge of causes and the secret notion of things; to the enlarging of the bounds of human empire, and the effecting of all things possible."

The address was followed by selections sung by the choir. Mr. Endicott then introduced the Hon. John H. Clifford of New Bedford, who was present at the request of Mr. Peabody, to represent him at the dedication of the Museum.

REMARKS OF HON. J. H. CLIFFORD.

Mr. President:—To the request of my honored friend, Mr. Peabody, that I would represent him on this occasion, I could return but one reply. Independent of the signal honor which this proof of his confidence implied, the necessity which imposes upon him a reluctant absence from these interesting ceremonies, would make me doubly anxious to gratify any wish he might express in regard to them.

My only regret is that the brief notice I have had of his wishes in this respect, and you know, sir, how very brief that notice has been, should make any response to his call so inadequate to such an occasion, and such an audience, as this. The occasion is one that challenges not only the sympathy and interest of the "Flower of Essex,"—I use the old familiar and patriotic designation, sir, with no limitation to either sex—but also of the distinguished devotees of science, whose national association, now in session here, enables you to grace these ceremonies with their presence.

Fortunately for me, neither does Mr. Peabody desire, nor do you expect, that I should represent him by any attempt at elaborate or extended speech. More fortunately, his own words, in that admirable letter in which he communicates to you and your associates his purpose in founding this trust, are at hand, to express all that he would care to say, or that could be said by any one in his behalf.

"Of this, my native county, I have always been justly proud, in common with all her sons, remembering her ancient reputation, her many illustrious statesmen, jurists and men of science, her distinguished record from the earliest days of our country's history, and the distinction so long retained by her, as eminent in the education and morality of her citizens." Such words as these require no rhetorical amplification to give them instant access to the heart of every son and daughter of this favored county, and, followed as they are by the declaration of a princely donation to aid "through her means in the diffusion of science and knowledge through future generations," they find their response in the heart of every generous lover of science and virtue throughout the world. They anticipate, Mr. President, his congratulations, and his gratification upon the spirit already evinced by you and your associates in nurturing the fruitful and beneficent vine he has here planted. The utterance of this gratification, and these congratulations, I am sure, would be the measure of his speech if he were present, and I am equally sure he would enjoin upon me, as his honored representative, not to fail in expressing them. I know how his eye would kindle and his countenance become radiant, as I have seen them on other occasions, when expressing his satisfaction with the labors of those to whom he had intrusted the administration of his munificent bounties. They assure him of the only reward his great heart craves for all his noble benefactions, their success in promoting the glory of his country, and the highest welfare of his fellow men.

Mr. President, I find it very difficult to speak *for* Mr. Peabody and not to speak *of* him. But even in doing this I am still fortunate in being able to do it in his own matchless words. They are drawn, sir, from a conversation, the most delicate sensitiveness of neither party to which could object to having repeated to the world. Upon a recent most delightful reunion of a few of his friends at the Peabody Institute, in his native town, an occasion which none of us whose good fortune it was to participate in it will ever forget, and just before he started upon that pilgrimage for the health we all so fervently pray may be restored to him, one of his guests was another son of Massachusetts, of a spirit kindred to his own. Bred to the same pursuit with Mr. Peabody, like him a prosperous and successful banker, he has learned in the prime and vigor of his manhood the precious secret so sadly closed to most accumulators of great wealth, how to invest in immortal securities of benevolence and charity, the treasures of which he acknowledges and recognizes his stewardship.

As I stood by the side of these two representative men, the number of whom, now alas, so few, I trust is destined to be multiplied by their bright example, I felt proud that Massachusetts was the mother of them both — and I could not refrain from saying something to Mr. Peabody of the proofs I had witnessed of the large and judicious benefactions of the other, so like his own, to his native place. "Oh, yes," said Mr. Peabody, "I know all about it," — and turning to his friend and compeer, continued, "go on, go on. It is sometimes hard for one who has devoted the best part of his life to the accumulation of money to spend it for others. But practise it, and keep on practising it and I assure you it comes to be a pleasure."

Golden words are these — worthy to be inscribed over the treasure vaults of every man, who, by the favor of a good Providence, has been permitted to acquire wealth. They are a discovery too, for a rich man, which in my judgment, places the name of their author in the rank of inventors by the side, if not above, those by whom the rolls of practical science have been most brilliantly illuminated.

The lives of two such men as these lead us to doubt the justice of that keen reproach of one of our most graceful Massachusetts poets, still living in an honored old age, that the banking house is a place

> "Where thought grows barren and nought breeds but gold."

If I were speaking of Mr. Peabody, sir, and not *for* him, I should say that, for more than all things else, entitling him to our reverence, honor and love, more than for the marvellous breadth and catholicity of his great charities even, which you have so impressively grouped and described, is this shining and, it is to be hoped, persuasive example to the rich men of his day and generation, of the truest and most satisfying uses of their great accumulations.

But in his name I must utter one parting word of benediction upon your trust.

This "good old County of Essex," as he so fondly and filially calls her, will have no cause to lament the decline and decay of that Oriental commerce, the great prize of the world for which nations compete, by which she was once so distinguished and so enriched, if you, Mr. President, and your associates and successors, are faithful to this noble trust. To the long succession of generations who shall avail themselves of its advantages, and to the county of which, I doubt not, it is destined to be the ornament and pride, it will bring richer returns, than all "the wealth of Ormus and of Ind," and its work will be crowned by that double blessing assured both to him who gives and to them who receive,—the treasures of good learning and of manly virtue which the "Peabody Academy of Science," is designed to foster and impart.

Mr. Endicott, after alluding to the very liberal manner in which the City of Salem had assisted the Academy, introduced his Honor the Mayor, Gen. William Cogswell.

REMARKS OF MAYOR COGSWELL.

Mr. President and Gentlemen:—I know that I speak the sentiments of the people of this city when I congratulate you, sir, and your associate trustees, upon the successful establishment, in our midst, of this Academy of Science, under the wise and beneficent trust of that world-wide benefactor, whose name stands at the head of your institution. Although your labors were at the outset clouded and increased by the great loss which we all felt here in the death of the first president of your board, yet the citizens of this place which has been honored by the location of this Academy, though its purposes are to be devoted to the broader field of the whole County of Essex, have witnessed with pleasure the great progress which has been made in the discharge of the duties of your important trust. They are aware of the vast amount of labor, which, under the careful and able supervision of yourself and associates, has wrought out all this; they are sensible of the good results which must inevitably flow therefrom, and therefore it is with honor and with pride that they join you this day in the dedication of the Peabody Academy of Science, and bid it, as they do now bid it, all hail, welcome, and God speed.

Dedicated to the cause of science — that cause to which all now look for truth, instruction, and the explanations of the hidden mysteries of life — through which we learn to understand the ways of nature and to make useful all the powers which God has given us — from which we learn to read aright the lessons of experience and to make more perfect the labors of mankind — science which leads not from but to a better, higher, nobler appreciation of God and his infinity — dedicated to this great study and in the presence of the eminent scholars of science of our land, who shall attempt to set forth its useful results, its perfect work, its future, or its effects upon the great study to which it is now dedicated and set apart? Who will follow out its influences, unbounded and without a limit as they will be, as from father to son, from generation to generation, it shall send forth the influence and energy of developed truth into the great struggle of life, and into the current of the great river of knowledge?

When we reflect upon the immense scope of the study of science, touching every interest and inquiry of life, sifting and exposing error, underlying the superstructure of government, of life, of health, of knowledge and of wisdom, opening to us the secrets of nature, bringing us, whether we will or not, up on to a higher, broader and better plane of existence, leading us to discard error and prejudice, and to adopt the truth, training the lightning to do its bidding, exchanging as it does this day exchange the thoughts and wishes of continents and publishing the edicts of nations in "the twinkling of an eye" — when we call to mind that all things yield up their secrets to the all-searching and never-tiring eye of the man of science — when we consider the relation it bears to the body politic — that upon it government must depend alike for its implements of war and the development of its resources in time of peace — that railroads, canals, surveys, the census, harbor improvements, the levying of taxes, the waging of war, the commerce of the seas, the products of the soil, that "the institution, maintenance and administration of government" in order "to secure the existence of the body politic," so as to "protect it and to furnish the individuals who compose it with the power of enjoying in safety and tranquillity their natural rights and the blessings of life;" when we consider all this and that government in all its branches and departments, in all the delicate machinery of administration must follow the laws of science or follow not at all. When we remember this, who but will welcome every aid in behalf of science? Who but will give thanks and praise at the founding of each and every academy dedicated to its great and ennobling labors? And who but will love and revere the man whose never-failing spring of love to his fellow man has builded in our midst this temple in its honor, and most especially does it become the municipality, which has been made the favored recipient of such a trust to take a deep and an abiding interest in all that appertains to its welfare and success.

I feel gentlemen, the difficulty under which I labor in speaking to the cause of science in this presence, for I am as a stranger in its field, but I can bear my willing testimony to the vast amount of good it has already accomplished. I feel that to it all things are possible, and I know that I reflect the feelings of the citizens of Salem when I greet this occasion as the dawning of better and more glorious days in the history of this, our city, so full of its proud memories, which we all delight to honor, and in whose welfare we all take a loving and an earnest part.

I should fail, however, in my duty here, did I omit to pay my tribute of respect to the genius and skill and industry and devotion of those gentlemen who, if life is spared to them and they are spared to you, are destined to make your trust a perfect and a famed success. I refer to the present officers of your Academy.

It is a delicate matter to speak of them in their presence, yet I cannot help saying, what everybody knows, that fortunate indeed is the institution which can claim them as its own.

But, sir, I shall turn away from the attempt to speak the feelings of those I have the power to represent — or of myself — the feelings of admiration, gratitude and respect towards him whose bounty, reaching from continent to continent, has fallen upon our heads, for I feel that all words of praise would be commonplace, that all expressions of gratitude would be trite, and that all words of compliment would be empty when laid at the feet of so great a doer of good. And now, allow me to say that the Essex Institute so favorably known, under its wise and active management, with the Peabody Academy of Science so successfully inaugurated, with the far-famed East India Museum brought now to a more public use, and with the eminent men connected with them, happy and fortunate indeed must be the city which holds them all within its limits, and I feel that I can pledge you, now and always, the earnest support and coöperation of the City of Salem.

Mr. Endicott then introduced Benjamin H. Silsbee, Esq., President of the East India Marine Society, who responded in behalf of that organization.

REMARKS OF B. H. SILSBEE, ESQ.

Mr. President:—I cheerfully accept your invitation to take part in these dedication services, as the representative of the East India Marine Society, of which you have spoken in such kindly and complimentary terms, one of the oldest associations in this country, one somewhat unique in its characteristics, and one whose valuable collection gathered during many years, and from almost all parts of the world, has now passed into your hands, by an arrangement deemed advantageous to both associations. And thus we seem but to have fulfilled the order of that Providence which "maketh all things new." Old ideas, with the rust of age on them, must give way to new ones, fresh with the vigor of youth. Old associations, which have done their work, and accomplished the purpose for which they were organized, must be superseded by others more in accordance with the spirit of the age. That spirit is progress; and we see its influence in religion and philosophy, in art and science, in trade, and in the common pursuits of life. More liberal views in religion and philosophy, wonderful improvements and vast discoveries in art and science, great changes in trade, and rapid advances in civilization and refinement, mark the steps of this progress, and lead us to the highest anticipations for the future. It is difficult to realize how much has been accomplished in these great interests since the commencement of the present century, and the mind is almost bewildered by the prospect of what further progress may be made before that century is closed. But it is not my province, nor will the time allotted to me suffice, to attempt any sketch, however slight, of the great work that has been done, or to prophesy what is yet before us. In the presence of an audience like that which fills these walls to-day, any attempt of this kind would be presumptuous on my part, and I have only alluded to the subject as suggested by the occasion which brings us together. Your new Academy, Mr. President, founded by the munificence of one whose name has become proverbial for liberality, and who has done more perhaps to promote art and science and education than any man who has ever lived; with a collection already very large and very valuable; with a corps of scientific men, young and ardent, and well trained for their work; is this day dedicated to the great cause of human progress in art, science, and civilization. May God prosper it, and may the enlarged and liberal views of its founders ever guide and govern its managers. And now, Mr. President, I propose to give a hasty sketch of the origin and history of the "East India Marine Society," whose museum, somewhat famous in past years, has now been transferred by its members to your care, because the time had come when they could no longer keep it as it should be kept; because in the order of events, the old must give way to the new.

In the summer of 1799 several shipmasters were assembled one day on one of our now dilapidated wharves (then the seat of an active foreign trade), and then and there was started the idea of an association, which resulted in the formation of the East India Marine Society. It was organized on the 14th day of October of that year, by the choice of Capt. Benjamin Hodges as President, Capt. Jacob Crowninshield (your honored grandfather, Mr. President) as Treasurer, Capt. Jonathan Hodges as Secretary, and Captains Ichabod Nichols, Jonathan Lambert, and Benjamin Carpenter as Committee of Observation. Many of the earlier members were parishioners of the late Rev. William Bentley, D.D., distinguished not only for his great learning and his enlarged and liberal theology and practical christianity, but for his interest in and knowledge of everything that concerned the welfare of Salem, and some of the preparatory meetings were held in his study, and he took part in drawing up the articles of organization.

The chief objects of the institution were declared to be first, "to assist the widows and children of deceased members who may need it, out of the funds of the society;" second, "to collect such facts and observations as tend to the improvement and security of navigation;" third, "to form a museum of natural and artificial curiosities, particularly such as are to be found beyond the Cape of Good Hope or Cape Horn." The first article of the by-laws provided that "any person shall be eligible as a member of this society who shall actually have navigated the seas near the 'Cape of Good Hope' or 'Cape Horn,' either as master or commander, or as factor or supercargo of any vessel belonging to Salem, or if resident in Salem, of any vessel belonging to any port in the United States." These conditions of membership have always been observed, and under them 348 have joined the society, and 278 have deceased, leaving 70 surviving members. As to the first object of organization, "assistance to indigent members and their families," the society has always contributed to the extent of its funds, and has helped to make comfortable the declining years of many of its members, and to alleviate the wants of their widows and children. But the sympathies of the members of the society were not confined to their own number. With the proverbial generosity of seamen their hearts and hands were opened to the needs of others.

In January, 1809, during the period of the embargo, when there was much distress among the laboring classes of our then exclusively mercantile town, it was voted by the Society that a concert be given in their hall for the relief of the poor, and that all expenses be defrayed by the members.

This concert was subsequently given, and the sum of five hundred and sixty-four dollars (a large sum to be raised by a musical entertainment in those days) was collected and distributed.

As to the second object of the organization,—"improvement in navigation"—the records of the society show a continued interest in this subject, and the large collection of journals (upwards of ninety in number) kept by many prominent members, and in the early days of the society, when navigation, as compared with the present time, was in its infancy, proves that this important object was not overlooked. The earliest journal on our catalogue, written previous to the formation of the society, was kept by Nathaniel Bowditch, a name known and honored throughout the world, then supercargo of the ship "Astrea," on a voyage to Lisbon, Madeira, Manila and back—1796-97. Many may not be aware that this remarkable man, distinguished not only for his vast acquirements, but for the purity of his life, was for some years master or supercargo on voyages from Salem to the East Indies. Another journal on our catalogue, was kept by him when master of the Ship "Putnam," on a voyage from Salem to Sumatra, Isle of France and back—1802, 1803. Mr. Bowditch joined the society in the autumn of 1800, and continued an active member till he left Salem, in 1823. He was its secretary one year, inspector of journals sixteen years, and its honored president three years. Who can doubt that with such a leading spirit among its active members, one of the main objects of the society should receive its due care and attention. At a meeting of the society in May, 1801, a committee of six members was appointed to examine a work called the "New American Practical Navigator," by Nathaniel Bowditch. The committee subsequently reported in the most favorable terms of the excellence of the work; "that he has corrected many thousand errors existing in the best European works of the kind; that he has in many instances greatly improved the methods of calculation, and added new ones of his own, and that in their opinion it is highly deserving of the approbation and encouragement of the society." The opinion of these early pioneers in navigation, has been confirmed by the unanimous verdict of their successors, and "Bowditch's Practical Navigator" has for very many years been the standard work on the subject. Dr. Bowditch resigned as president of the society in July, 1823, and they voted "that they accept his resignation with much regret, and that their thanks be presented to him for his assiduous and distinguished services for so many years, as shown by the prosperous condition of the society." As to the third object, the collection which now belongs to your society, Mr. President, will testify as to the faithfulness of the members in this particular. The large majority of the articles were contributed by members, brought home by them on their different voyages. Some were obtained by purchase and exchange, and some have been voluntary contributions from others, not members, whose donations were always gratefully acknowledged by the society. The museum of our society has always been open to the public, the only restriction being that the visitors must be admitted by a member. No fee has ever been charged or allowed. Attempts have been made to make a change in this respect when the funds of the society were low, but the majority would not deviate from the broad and liberal ground taken by its founders, and for nearly seventy years, during the summer season, our hall has been open to visitors from all parts of the country.

I congratulate you, Mr. President, that your Academy starts on the same liberal plan; and that the public are to receive pleasure and instruction from the inspection of your collection. The hall first occupied by our society was in the building now standing on the corner of Essex and Washington streets. In 1804 they removed to a then new building in the rear of the present Downing Block, occupied for many years by the Salem Bank and the Savings Bank. In 1824, finding their accommodation still too confined for their large and increasing museum, measures were taken for the erection of a new building. As the society had not funds sufficient for this purpose, a new corporation was formed, called "The East India Marine Hall Corporation," of which our society held the largest amount of stock, and the stone and brick building, which for more than one generation has been known as the "East India Marine Museum," and which is now owned and occupied by the Peabody Academy of Science, Mr. President, was erected in 1824–25.

The occupancy and opening of the new hall in October of the latter year, was celebrated by a procession and dinner, at which were present, among many distinguished men, Mr. Adams, then President of the United States; Mr. Quincy, then Mayor of Boston; Mr. Justice Story, of the United States Supreme Court, and Rev. Dr. Kirkland, President of Harvard College. The social element had a somewhat prominent place in our society in its earlier days, and for many years after its formation a dinner was held at the hall at the period of the annual meeting, to which many of the prominent gentlemen of Salem were invited, including not only merchants, but distinguished members of the liberal professions. A procession was generally escorted through the principal streets, by military and music, the officers being dressed in Oriental costume. In those early days of the society, a deep interest in its welfare was felt by the citizens at large. They were proud of its museum, and justly held in high esteem its officers and members. In the latter part of the past century and the earlier years of this, there were, of course, not so many avenues to wealth and advancement as at the present time. Commerce seemed the only field, in which the enterprising and active young man could hope for distinction and eminence. Manufacturing as an occupation was then unknown. The arts and sciences and liberal professions offered but little inducement, the way to success in them seeming slow and difficult. But in commerce, in trade, in the idea of visiting foreign lands, with the expectation of rising rapidly to high position and wealth, there was something to excite the ambition and encourage the natural spirit of enterprise of young men; and the result was that the best and most intelligent among them sought positions in our then young and small mercantile marine, readily taking the humblest places, feeling sure of a rapid rise to the highest positions, if they but showed themselves worthy of them. It was of this class of men that the "East India Marine Society" was formed; self-made men who had started early in life, and carried their country's flag, and transacted business, in almost every part of the world. In those days these men not only commanded their ships, but were also factors, doing business to a large amount, and frequently intrusted with great discretionary powers. It is not to be wondered that such men were looked up to with respect, and that when they gave up their sea life, they were called (as many were) to fill important places in the town and state and nation. Our good old city, Mr. President, was the pioneer in the East India trade, and for many years more vessels arrived here and more goods were landed, than at any port in the United States; and it may safely be asserted that during the early part of this century, a large majority of the vessels that sailed from this country beyond the Cape of Good Hope or Cape Horn, were Salem ships, commanded by Salem men, most of whom were members of our society. But now all is changed. These men have passed away, and the commerce of Salem has departed. Other avenues to success in life have been opened, and most of our young men seek other professions than that of the sea. The East India Marine Society continues its distinct organization, holds its regular meetings, and distributes the income of its funds in charity. The time may come when it shall be extinct; but it cannot soon be forgotten among the descendants of its founders. And its museum, watched over and taken care of, as it will be by your Academy, will help to keep fresh the memory of those active and enterprising and able ship-masters, whose canvas was spread to the breeze on almost every sea, and of whom we, their children, may justly feel proud.

Dr. Henry Wheatland, President of the Essex Institute, was then introduced by Mr. Endicott.

REMARKS OF DR. HENRY WHEATLAND.

I thank you, Mr. President, in behalf of the Essex Institute, for your kind notice on this occasion. The Institute has only to say that it has been humbly following out the plan handed down by past generations for the promotion of education and general culture, modified in some degree to meet the wants of the community and the requirements of the age. What little success may have attended its efforts is mainly due to the examples and precepts of those who have preceded; these early pioneers in the cause of science have borne the heat and burden of the day and have prepared the way, thus leaving it comparatively easy to follow.

We have an honorable record: each successive period in our history, from the landing of Conant, Endicott and Higginson, from the time of Roger Williams and Hugh Peters to the present, has enrolled many names illustrious for professional attainments, mechanical industries, and commercial enterprises. These materials did not crystallize into any permanent form until about the middle of the last century, when they assumed that of a social club composed of the leading spirits of the day and holding weekly meetings.* At these meetings the principal topics of the day were discussed, especially those of a literary and scientific character; one was the suggestion of the formation of a library similar in its character to that which Franklin had established in Philadelphia some twenty-five or thirty years previous, and that at Newport by Redwood, a few years afterwards. This movement resulted in the formation of the Social Library in 1761.

Some twenty years roll away and we behold the privateer ship Pilgrim, Hugh Hill, commander, owned by the Messrs. Cabot, bringing into the neighboring port of Beverly a collection of books, being part of the library of the celebrated Irish chemist, Dr. Richard Kirwan, which was taken from a schooner captured during the early part of the year 1781, in the English Channel. These books, comprising the Philosophical Transactions of the Royal Society of London, Memoirs de l'Academie Royale des Sciences Paris, Miscellanea Berolinensia, Boyle's works, Bernouille Opera, Wolfii Elementa Matheseo and others, were purchased by a company of gentlemen, and thus constituted the Philosophical Library; this addition to our resources gave a new impulse to scientific investigation, and aided many in their researches. The late Dr. Nathaniel Bowditch, when a young man, had access to these books, and thus was enabled to develop more fully that genius which enabled him to be the expounder of La Place, and to take a leading position among the mathematicians of his age. In his will Dr. Bowditch made honorable mention of his indebtedness to this library in his early studies. Among the proprietors of this library may be mentioned Rev. Joseph Willard, afterwards President of Harvard College; Rev. Dr. M. Cutler, of the Hamlet in Ipswich, one of our earliest botanists, and the originator and conductor of a company who emigrated from this county in 1788 to the West, and founded the settlement of Marietta, on the banks of the Ohio; Drs. E. A. Holyoke and Joseph Orne of Salem, and others.

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*These meetings were held at Pratt's tavern, located on the northeast corner of Essex and Washington streets. At that time the tavern was the great place of resort for the people; meetings of the various clubs, committees, etc., were always held there.

Another score of years pass, and we behold in a small room in the third story of a brick building erected on the site of the old tavern, previously mentioned, and now occupied as a part of the printing office of the Salem Observer, the nucleus of a museum originated by several of our citizens engaged in the East India trade, then the leading business in Salem, and around which, by gradual accretions, has grown the famous East India Museum, the rearrangement of which, with the scientific collections of the Essex Institute, constitutes the Museum which the trustees of the Peabody Academy of Science this day dedicate to the public.

It is, perhaps, needless to trace further in detail the growth of our institutions; the principal facts in their history have appeared in the printed publications of the Institute. Suffice it to mention that the Salem Athenæum was incorporated in

1810; the Essex Historical Society organized in 1821, and the Essex County Natural History Society in 1833, were united and incorporated in 1848 under the name of the Essex Institute.

The building of Plummer Hall, in 1856, from funds bequeathed to the proprietors of the Salem Athenæum, by the late Miss Caroline Plummer of Salem, and in which are deposited the principal libraries, constitutes an important era in our history. It is a singular coincidence that this building was erected on the site of the house in which Prescott, the historian, first saw the light of day.

The donation of Mr. Peabody in 1867, and the consequent formation of the Peabody Academy of Science, a full account of which has been so ably and eloquently presented by you on this occasion, has relieved the Institute of a portion of its duties, some of which have already been transferred to the Academy, viz., the care and maintenance of its museum and the publication of scientific papers, especially those that illustrate the natural history of the county. This forms another very important epoch in our history.

This donation of Mr. Peabody came very opportunely, at a time when the materials were at hand to organize an institution on a good basis, with large and valuable museums and a corps of able workers. The museum of the East India Marine Society had been accumulating for many years, and had acquired a well merited reputation. The Essex Institute had within the past few years gathered together a corps of active young naturalists and historical students, and had awakened a deep interest in scientific studies and historic research by its field and other meetings, its lectures and publications, and at the same time added largely to its library and its various collections, awaiting, as it were, some such endowment as that of Mr. Peabody, to galvanize them into a more active sphere of usefulness.

The Institute has cause for great congratulation that one of its cherished departments is so well cared for, and that under the auspices of the Academy, an accurate survey of the natural resources of the county will be made, that the same may be developed to the fullest extent; and that a knowledge of the sciences, especially their application to the arts, be diffused among the people, so that, by the aid of skilled labor, the greatest practical results can be obtained with the least expenditure of time and capital.

The Essex Institute, in its organization, recognizes three departments, that of Natural History, History and Horticulture.

The first, as has been before mentioned, is in good hands. It is immaterial who does the work, or who has the credit for doing the same, provided that it is well done. The second and third have no special endowment, and what provision they receive must come from the ordinary income or from some future acts of munificence.

The Horticultural department has taken in years past a prominent position in the doings of the society; the exhibitions of fruits and flowers have been considered as ranking favorably with those of similar institutions. This city and vicinity have always had a goodly array of enthusiastic and successful cultivators of the choicest productions of Flora and Pomona. Among those of the past, the name of Robert Manning, the elder, stands prominent as a pioneer in the cultivation of fruit, especially that of the pear. The garden of J. F. Allen exhibited for several seasons a fine display of that gorgeous lily, the "Victoria Regia," and his excellent treatise on this flower, with superb illustrations, finds a place in every public library. Yet later, Allen's Hybrid and Rogers' Seedling grapes are attracting the attention of all the cultivators of this choice and delicious fruit.

Essex County is one of the oldest in New England; her records date back to an early period. Her children have been and are now among the prominent in all the greatest enterprises of their respective periods, and have received their merited reward. Let us cherish their memories with strict fidelity, and transmit the same unimpaired to the latest posterity. To this end it is necessary to preserve with the greatest care, all papers, loose manuscript leaves, interleaved almanacs with inserted notes, old records, diaries, etc., that are scattered throughout our county; they are found in the archives of our towns, and the various parishes, and in almost every hamlet.

The County Commissioners have, with a wise forethought, done a good work in having the papers belonging to the old Quarterly Court properly arranged and placed into volumes, the whole carefully indexed under the superintendence of W. P. Upham, one of our most careful and zealous antiquarian scholars. Thanks to the commissioners for what has thus far been done; may they be induced to extend the same protecting care to all the other records that are deposited in the various county offices.

It is very desirable that the Essex Institute should be placed in a condition to collect and arrange in a similar manner, all the scattered materials that will elucidate our history; if the originals cannot be obtained, exact copies of the same should be carefully made. Many of these papers will undoubtedly be found worthy of being printed, and if so, provision should be made that the same be done. An opportunity is here offered for some liberal-minded son or sons of Essex to contribute to this worthy object. In no better and more enduring way can one be remembered in the future than by cherishing a due regard for the memory of those who have contributed so much for the comfort and happiness of the present generation.

Mr. Endicott introduced Dr. J. W. Foster, of Chicago, President of the American Association for the Advancement of Science, who spoke as follows:—

REMARKS OF DR. J. W. FOSTER.

Mr. President, Ladies and Gentlemen:—These exercises have been protracted to such an extent that I shall only trespass upon your patience for a single moment. It gives me great pleasure to be present on this occasion, and to participate in these proceedings. To-day has been rendered the crowning event by which this Academy is forever dedicated to science. But while the words of the trust are "for the promotion of science and useful information among the people of the County of Essex," the benefits of this institution are not to be circumscribed by county lines or state lines. Its portals will be thrown open to every cultivator of science, come from what quarter he may.

Here, this day, has been laid the foundation of a superstructure on which shall rise a temple dedicated to science, coherent in all its parts, and appropriate in all its adornments. The world does not appreciate the obstacles that beset the path of scientific men; it is by no means strewn with flowers. How rarely is he the possessor of hereditary fortune, which admits of a life of learned ease! So far from it, he is often compelled to toil for his daily bread and at a compensation which would be spurned by an ordinary clerk. If he discover a valuable principle, and one capable of economical application, and should undertake to monopolize that principle by letters patent, he at once loses caste with his associates. The same zeal and ability, which in other pursuits bring an adequate reward, in his case bring but a precarious support. The brightest vision held out to his gaze is that, after a long and laborious life, he may have achieved something whereby his name and his memory shall be cherished by coming generations.

So many are the observers in science, and so costly are the publications in which the results of their labors are recorded, that I know not in my acquaintance a single scientific man that is able to possess the works that relate to his particular department. It is said of Humboldt that he was unable to own a complete set of his own works. We all know they are too costly to be within the reach of individual purchasers. It is only, therefore, through institutions like this that costly knowledge can be gathered up and made available. Through this institution collections of specimens can be made for the purposes of study and comparison. Here can come the student of science, and satisfy himself whether his investigations have been anticipated; here gather materials to fortify himself in the correctness of his conclusions. Here will be struck out ideas which shall lead to an enlarged sphere of thought, and ultimately to an enlargement of the boundaries of knowledge.

But it may be asked, what is the use of these pursuits? In reply I would say that whatever advance society has made in civilization is due to the study of natural laws. Philosophers have determined mathematically the figure of the earth, and the movement of the heavenly bodies. They have investigated the properties of light, heat, and magnetism, the expansibility of water, and the effect of various chemical combinations. While these scientific results convince us of the beauty and harmony which pervade the entire domain of Nature, the practical results are to be seen in the steam-engine, in the power-loom, the telegraph, the railway, the mariner's compass, and a thousand combinations of machinery to supersede human muscles, and a thousand combinations of materials to minister to human wants.

The prodigious impulse which has been given to commerce, to manufactures, to mining, to subduing vast areas of the earth's surface, has resulted from this mastery over the forces of Nature. Never before in the whole history of the world has there been such a rapid accumulation of material wealth; yet this accumulation has resulted in extreme conditions in society, — great opulence on the one hand, and abject poverty on the other: and while one class indulge in luxurious ease, the other class, from out of the depths of poverty, behold a display of luxury which is ever beyond their reach.

Now I believe, Mr. President, that Nature is all bountiful, and that she will so far allow man to acquire the mastery over her forces, that life with no one shall become a mere struggle for existence; that a moderate exercise of physical powers shall secure to the individual a support, and ample time for the development of his social and intellectual faculties.

All honor, then, to the founder of this institution, who has taught to his countrymen and to the world this lesson; that wealth is to be acquired, not to gratify sordid avarice or luxurious ease, but that it is to be so appropriated as to enable us to enlarge and utilize our knowledge of natural forces, and thereby to contribute not only to the comforts and conveniences, but also to the moral and intellectual elevation of our race.

At the close of Dr. Foster's address, the dedicatory exercises were concluded with a benediction by Rev. Edmund B. Willson, of Salem.

NOTE.

At the concluding session of the Salem meeting of the American Association for the Advancement of Science, held in the Tabernacle church, on Wednesday afternoon, August 25, 1869, — Professor J. S. Newberry, of Columbia College, New York, offered the following resolution: —

Resolved, — That the Association desires to express, in an especial manner, its high appreciation of the Peabody Academy of Science, and of its illustrious founder who has here established an institution which, under its accomplished President and Board of Directors, and its band of ardent and distinguished young naturalists, has already done so much for Natural Science, and furnished an example which it is hoped will find many imitators in our country.

Supporting this Resolution Professor Newberry said: —

In coming to Salem to attend this meeting of the Association I have accomplished one of the great purposes of my life. I have visited the East India Marine Museum, and have seen the idol "whose mouth is bigger than his head." I was born here in New England, and the glories of the Salem Museum, as they were described to me, fired my childish imagination and created a passionate longing to behold them. Within the past week the coveted pleasure has been mine. I have visited the Museum, have seen the idol and the mandarins and the carved ivory balls. Yet I am sorry to say my delight was hardly as great as it would have been years ago. Childhood and youth with their enthusiasm and hallucinations had passed, and my experience illustrated the old New England proverb: — "It takes a longer straw to tickle a man than a boy." To my blasé or matured taste some other stimulus was needed to create enthusiasm. But my visit was not destined to end in a disappointment. In the rich ethnological material derived from the East India Museum, and more particularly in the Natural History collections of the Peabody Academy, I found much that excited interest and admiration. In some departments this collection will compare favorably with any other in the country, and I may specially cite the collection of corals, arranged with so much taste, and so beautifully displayed in cases devised by the ingenuity of the corps of workers in the Museum, as the most striking and satisfactory of any I have seen. As a whole the Museum presents a large and varied assemblage of objects of scientific interest, arranged in a very tasteful and attractive manner; one indeed of which any institution or city might be proud. Still, while I was agreeably surprised by the magnitude and value of the material objects contained in the Museum, and with the effective manner in which they are displayed, I must confess that all this impressed me less than the varied and thorough scientific work which I find is being done in this institution. Of this work we have had some illustration in the meetings of the Association. The attention and applause given to the papers presented by the naturalists connected with the Peabody Academy have shown at least a partial appreciation of their interest and value, and yet I am inclined to suspect that their merit and significance have not been fully realized by all who heard them.

When Mr. Morse described to us the embryology and development of the *Brachiopoda;* as we saw the reniform ovum become, first a rounded *Orthis* with a long hinge line, then an elongated miniature *Lingula* throwing out a pedicle and anchoring itself to the rocks, then again expanding and developing its graceful lophophore with the crown of cilia, though we could not fail to be interested in his lucid exposition of these remarkable metamorphoses, and delighted with his unequalled skill in delineation, I fear there were some among us who looked upon the investigations that had led to these results as more curious than useful; as microscopic and therefore unimportant; when it is true that the successive phases exhibited by the growth of that little shell probably represent chapters in the life history of the class to which it belongs, and furnish the key to its generic grouping.

I have submitted to Mr. Morse a little land-shell found in the Coal Measures of Ohio. From his careful study of its allies he will be able to tell me whether it should be called *Dendropupa*, *Pupina*, or *Pupa*. "It matters little which," you say, but it matters more than it seems, for in telling me that, he tells whether this is an extinct form, one that, like so many others, has in the lapse of ages died out and disappeared, or whether it belongs to a group once living here but now driven far away to the Philippine Islands; or whether, finally, its lineal descendants, as like itself as child to parent, after millions of years are still crawling over the spot where it was entombed; whether, in short, this little shell has remained a fixed point in all the whirl of worlds and ages since the Carboniferous period, or whether it is itself the monument and measure of stupendous changes.

These careful studies of marine zoology, made by the attachés of the Peabody Academy, to some may seem minute and trifling, but to me at least they are of great interest and consequence. The sea is the mother of continents, and every fact which they dredge from the bottom of the ocean I can work into the geology of a state.

No less important and interesting than those I have referred to are the investigations made by Mr. Hyatt on the *Polyzoa*, Mr. Putnam on fishes, and Dr. Packard in entomology. It would be superfluous if not impertinent in me to assume the duty of complimenting or endorsing these gentlemen, or the institution with which they are connected, yet I may be permitted to express my surprise and pleasure in seeing so much and so good work done as I find there is in the Peabody Academy, and to bear my testimony, of however little value it may be, to the productiveness and promise of this one of the many grand and noble enterprises which we owe to the generosity of Mr. Peabody.

Of Mr. Peabody and his good deeds, however, I scarcely dare trust myself to speak lest that which, as it seemed to me, simple justice compelled me to say, might sound like fulsome laudation. But Mr. Peabody needs no eulogy from me. By his unusual and enlightened munificence he has endeared himself to thousands in the old world and the new, and has acquired such universal honor and esteem as to be beyond the reach of praise or censure. At least no words of mine can add to a fame so pure and bright as his.

And now Mr. President though I have briefly expressed my admiration of the munificence of the illustrious founder of this institution, my appreciation of the rare qualities possessed by its administrative head and corps of investigators, I should be untrue to my convictions and feelings if I did not add yet a word in honor of another who, as it seems to me, can justly claim a share of all praise bestowed on the Peabody Academy.

In the spirit and methods of the investigations which have been referred to I think we have all seen the hand of a master, and we know who has inaugurated and guided the important investigations in marine zoology which have been, and are now being prosecuted with most interesting results along our coast, and know that it is he whom we have so cordially welcomed back to the meetings of the Association after his long absence, and that he is with us at this moment. I refer of course to Professor Agassiz, and while we are passing our encomiums on the gentlemen of the Peabody Academy, and paying due honor to Mr. Peabody who has given of his wealth the endowment of this institution, let us not forget him who of his genius has contributed that, without which, the present admirable results would have been impossible.

Professor Agassiz said he had intended to say a few words in support of the resolution in reference to Mr. Peabody.

His name had, however, been coupled in such a manner with that gentleman, who was a friend of humanity, that he was unable to express himself from a pressure of feeling which just then he could not control. He trusted however that he should yet be able to say a few words which would show that the great mind, the large, broad soul, which had thought of the poor and given them comfortable homes, had acted with as much wisdom in the manner in which he had founded his intellectual benefits. The results which had already been obtained by the Peabody Academy in the arrangement of the Museum, were, perhaps, even beyond what had been represented by his friend, Professor Newberry. He wanted the citizens of Salem, under whose eyes this institution was to grow, to realize this day what the embryo was they were trying to rear, and what was to be the result of its final intellectual growth. Its intellectual influence on the community could not fail to be very far spread, for from what he had heard from the president of the institution in regard to the plan that had been adopted, he thought he could see in that plan something that would dispel from the minds of the community certain obstructions to truth in regard to matters in which we are all interested — our future eternal life — but of which now we scarcely dared to speak because what we should have to say went contrary to some established doctrines, and to some long cherished convictions with which the community was imbued, holding them as sacred doctrines, when well informed men knew better. He saw that the teaching which was to be given in these scientific institutions, would tend to bring about a new era in that system of popular education of which they were all so proud, but which at present was merely a system of routine teaching in comparison to that rational study of nature which elementary education might become. In this respect he thought that the benefit of the Peabody Academy was already felt, and that it would ultimately bear those fruits which would become palatable and beneficial not only for intellectual growth, but he would venture to say for the moral growth of the community. This growth would rise to a higher platform of morality, because it would be nurtured by enlightened intelligent culture, and would not merely be devotional. The next benefit which was flowing from these foundations, — and was yet to flow more richly in the future, — was the scientific advance which was apparent in the gentlemen connected with the institution, and which had added to the value of this meeting. Without entering again into an examination of the characters of the papers, he would say, in the presence of the ladies and gentlemen of Salem, that the papers which had originated in that institution, had been among the best, the very best, presented during the meeting. The institution founded by Mr. Peabody, covered an immense field, and he trusted the citizens of Salem would be deeply grateful for its being planted in their midst. In conclusion, he alluded to the value of the Museum of Ethnology and Archæology founded by Mr. Peabody in Cambridge.

SATURDAY, NOVEMBER 13, 1869.

TIDINGS of the death of GEORGE PEABODY of London having been received, a special meeting of the Trustees was held this day, to take suitable notice of this mournful event. Present, Messrs. Endicott, Wheatland, Goodell, Peabody and Perkins.

After appropriate remarks from the President and other Trustees, alluding to the character and public services of the deceased, a committee was appointed, consisting of the President, Secretary, and Mr. Peabody, to draft a series of resolutions, which were reported and unanimously adopted as follows: —

Resolved, — That the Trustees of the Peabody Academy of Science recognize, in the death of the distinguished founder of this Academy, the termination of a life actuated by a noble ambition to benefit and instruct mankind.

Resolved, — That here in his native county, among the noble institutions he has founded, we are keenly sensible of the greatness of his work and the magnitude of our loss; yet a fame so pure and a life so grand leave nothing to be said in praise.

Resolved, — That, while the people of two continents are paying their tributes to his memory, we tender our sympathies to his kindred and friends in their bereavement; and rejoice that his life was prolonged to witness so much good accomplished by his wise and munificent charities, and the assurance of their great future usefulness.

Resolved, — That the President be instructed, in behalf of the Trustees, to coöperate with other institutions in paying proper respect to the memory of MR. PEABODY, and in making the necessary preparations for his funeral.

Resolved, — That a copy of these Resolutions be sent to the immediate relatives of the deceased.

The meeting then adjourned.

SATURDAY, JANUARY 1, 1870.

The annual meeting of the Board of Trustees was called to order by the President, but out of respect to the memory of Mr. Peabody, whose remains were to be received in this county for interment, the meeting was adjourned to the call of the President without transacting business.

SATURDAY, APRIL 2, 1870.

The quarterly meeting and adjourned annual meeting of the Board of Trustees was held this day.

Present, — Messrs. Endicott, Wheatland, Peabody, Gray and Nichols.

In the absence of the Secretary, Dr. Wheatland was appointed Secretary *pro tempore.*

Reports of the Council and Treasurer were read, and it was

Voted,—That these reports, the doings at the meetings, and at the dedication of the Museum in August last, be printed under the direction of Dr. Wheatland.

The following votes were passed:

Voted,—That the sum of six thousand dollars be appropriated for the expenditures for the year 1870.

Voted,—That the Director be requested to terminate the arrangement with Mr. Bicknell.

Voted,—That the action of the Treasurer in leasing the rooms to the Naumkeag National Bank be ratified.

Voted,—That Messrs. ENDICOTT, PEABODY, NICHOLS and WHEATLAND, be a committee to solicit additional funds for the use of the Academy.

The Trustees then proceeded to the election of officers for the ensuing year and until others shall be elected in their stead. Upon ballot the following officers were declared elected:

President—William C. Endicott.

Vice President—Henry Wheatland.

Secretary—Abner C. Goodell, Jr.

Treasurer—S. Endicott Peabody.

Finance Committee—William C. Endicott, G. Peabody Russell, S. Endicott Peabody.

Executive Committee—William C. Endicott, Henry Wheatland, Abner C. Goodell, Jr., Asa Gray, James R. Nichols.

REPORT OF THE COUNCIL FOR 1869.

To the Trustees of the Peabody Academy of Science:

Gentlemen: In accordance with the vote of the Council, I have the honor to transmit, for your approval and consideration, the accompanying documents as the Annual Report of the Council.

Respectfully,
A. Hyatt,
Secretary of the Council.

Salem, February 18, 1870.

ABSTRACT FROM THE RECORDS.

Regular meetings of the Council were held on January 30, February 27, March 27, June 26, and September 25.

No business was transacted out of the regular routine of duties with the exception of the acceptance of the Director's Report relating to the cost of publication and the circulation of the Memoirs, which will be found in the records of the meeting on March 27.

The Annual Meeting which should have been held on December 25, was, out of respect to the memory of Mr. Peabody, adjourned until February 18, at which time the Reports of the Director and Secretary were read and accepted and ordered to be sent, with accompanying documents, to the Trustees as the Annual Report of the Council.

A. Hyatt,
Sec'y of the Council.

Peabody Academy of Science,
Feb. 18, 1870.

REPORT OF THE DIRECTOR FOR THE YEAR 1869.

THE second working year of the Academy, though one of varied incidental interests, has been fraught with much that is important to its future welfare. The work of arrangement has been steadily going on, and a comparison of the condition of the cases in the hall to-day, with that of a year ago, shows that, little by little, the officers are attaining the end in view, so far as relates to the arrangement of the Museum; and though there is yet an immense amount of labor to be performed before all the specimens can be properly mounted and labelled, the progress has been a marked one in that direction, as will be seen by a glance at the cases containing the radiates and protozoa, the fossils, the shells, the insects, the archæological and ethnological specimens, and the County collection.

The Museum has been opened to visitors five days in each week since May. In order to prevent the hall from being crowded at its first opening, the fact of its being ready for visitors was studiously kept from the papers and simply announced by taking down the sign of "no admittance," that had been over the door during the arrangement of the specimens. After it had gradually passed from mouth to mouth that the Museum was open, a tablet bearing the conditions and times that it was open to the public was placed on the door; but it was not until its formal dedication in August that it was officially announced as opened by the Trustees, and from that day the number of visitors has been larger than would generally be supposed in a city of the size of ours. On the first day of the opening, May 5, there were 106 persons admitted, and the total number from that day to this, December 25, has been 26,128, which is an average of 190 persons for each public day (namely, Wednesday, Thursday, Friday and Saturday of each week*).

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* The hours during which the Museum is open on these days are from 10 A.M. to 5 P.M. The greatest number of persons admitted during a single day was on Monday, July 5, when the hall was specially opened for the accommodation of the large number of strangers in town, and 1158 persons were admitted. The hall was also opened during all the days of the session of the "American Association," in August. Several schools from out of town have been admitted on Tuesdays, when no account has been kept. The hall was closed for several days out of respect to the memory of Mr. Peabody.

In this connection I must call attention to the enlightened policy of the Mayor and Aldermen, in granting the Academy's application for a special constable on public days at the expense of the city; though as the Museum is the only place in the city publicly opened for the benefit of our citizens and sojourners, it is really a simple matter of justice on the part of the city that it should contribute to the safety of so valuable a collection and important place of resort. In relation to this, I would suggest that the Constable of the Hall be uniformed similar to the police, if the police regulations will allow of its being done; for though the presence of a person with authority to keep order, and specially employed for that purpose, is an immense advantage, still his citizen's dress does not make him conspicuous enough to be readily found in the crowded hall, and the simple effect of a police uniform upon the minds of the young is of great importance in the maintenance of order in such a place.

During the past year 397 contributions to the Museum have been received from 271 different contributors. For a list of these I refer to the report of Mr. Cooke.

A number of books and pamphlets have been received, and have been duly acknowledged by letter, and also in the pages of the *Naturalist.* All books and pamphlets of such a scientific character as to be of use to the officers are retained at the Academy, while all others are properly stamped and deposited in the Essex Institute Library. In this way a valuable and special scientific library is gradually being secured to the Academy without the accompaniment of a mass of works on general literature and on subjects foreign to its purposes. At the same time the preservation of such works is secured by placing them in the charge of the Institute, where they will form valuable additions and be accessible to those whose tastes are in that direction.

The want of suitable work rooms for the officers, in addition to those now occupied, was alluded to last year. Owing to the Academy's not having control over the land on the eastern side of the building, a structure has been erected there which completely shuts out what little sun before reached two of the rooms, and has cut off the light from them to such an extent as to render them perfectly useless as rooms for investigation. A room, separated from the present building, for the preparation of anatomical specimens is much needed.* It would also add greatly to the safety of the Museum building if the large mass of alcoholic specimens now in the cellar could be kept in a building distinct from the Museum. The last warning we have had in the partial destruction of the Ward Museum at Rochester, added to the sad disasters to the museums of New York, Portland, Chicago, St. Louis, and Washington within the past few years, should induce us to use every means in our power for the safety of the collection in the charge of the Academy. I beg the Council will therefore call the attention of the trustees to the importance of providing for a building in the rear of the Museum that shall be adapted to the wants of the Academy.

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* A room properly adapted for the purpose of photographing specimens is also much needed, in order to facilitate and greatly reduce the cost of making illustrations for publication. Such a room as is desired could be secured in connection with the Anatomical and Storage rooms here spoken of.

A number of important investigations have been carried on by the officers of the Academy during the past season, though owing to the time necessarily taken for the arrangements of the meeting of the American Association for the Advancement of Science, and the devotion of the officers to the work of the Association, fewer excursions were made during the summer than would otherwise have been the case.

Several of the shell-heaps in the county have been investigated, and the results now obtained show all the heaps on our shore to be of the same character and of very nearly the same period, though the formation at "Eagle Hill" is much the most extensive, and its lowest beds are probably the most ancient of any deposit we have in the county. This heap has not been thoroughly explored, and it is hoped that we shall be able at some future time to systematically explore it by cutting a trench through that part of the hill occupied by the heap and obtain a true insight into the condition of the land at the time the first shells were deposited, and, if possible, obtain some data as to the age of the heap.

Very careful and thorough explorations have been made of the shell-heaps on Plum Island by officers of the Academy, in connection with Professor Wyman, Dr. Dalton and the Messrs. Elliott and Lewis Cabot and Mr. McNiel, and a number of fragments of pottery, with several bone implements, two pieces of pipe stem and part of a pipe bowl were obtained, in addition to the usual bones of animals found in the heap at "Eagle Hill." The fragments of pipes were the most interesting relics from this locality as they are believed to be the first that have been found in the shell-heaps in this State, certainly the first from this county of which we have knowledge.

Mr. Cooke has at various times through the summer carried on his investigations of the Forest River shell-heap, in which he has been assisted by several friends. His researches have resulted in finding several stone and bone implements, and the very important discovery of a human skeleton buried under the heap, with indications that it was buried before the deposit of shells was made above it, as the earth around the skeleton was not mixed at all with the shells, which could hardly have been prevented had the body been buried by digging through the shells. Mr. Cooke made careful examination to this effect and Mr. Morse made a drawing of the position of the skeleton before it was disturbed.

A very brief examination of a thin deposit of shells at "High Rock Pasture," in Lynn, made during a Field-meeting of the Essex Institute, resulted in finding two Jasper arrowheads, one bone "fish-spear," and the bones of several mammals and fishes, the most prominent among them being those of the Deer and of the Goose fish (*Lophius*); a single tooth of a small cetacean was also found. This deposit, being different in its character from any other we have yet discovered, will be farther investigated, and we have the promise of the proprietor (the Hon. James N. Buffum of Lynn) to plough the field for the purpose.

The enthusiasm of several of the officers in the investigation of these ancient remains has had a good effect on a number of gentlemen in various parts of the county who have collected a large number of specimens and forwarded them to the Academy.

Mr. Morse made a dredging expedition to Eastport, Me., for the purpose of studying the development of some species of mollusca, and was so successful on his first day's dredging in obtaining the young of a species of Brachiopoda, that the whole time of his trip was occupied in the study of their development and in making drawings of the different stages of the animal. The results of these investigations were presented before the meeting of the American Association, and have been noticed in the *Naturalist.*

Mr. Hyatt passed a portion of the summer on the seashore at Gloucester for the purpose of investigating the Marine Polyzoa, and has made a number of drawings of the animals, showing the results of his investigations. He was also successful in finding a genus of Cephalopods entirely new to our coast.* Mr. Hyatt has also commenced a survey of the Geology of the county.

Dr. Packard has made considerable progress in his researches into the economy of Insects, especially those injurious and beneficial to the various products of the farm and garden, and has commenced the formation of an interesting and instructive collection of Insects illustrating this department of entomology. He has also continued his investigation in relation to the marine worms and lower forms of Articulata and has personally collected much valuable material for future study. During the past three months he has given twenty lectures on Entomology at the State Agricultural College at Amherst, which were well received and productive of good results at the College. He has also prepared a report on new and little known injurious insects of the State, for publication in the next volume of reports of the Secretary of the State Board of Agriculture, with a number of illustrations of injurious insects not before figured. It is hoped that the next Legislature will provide for an Annual Report on Entomological matters by the appointment of a State Entomologist, and there is certainly no one in the State better qualified for such a position than Dr. Packard. In this connection I may allude to the elaborate and most thorough work of the kind ever published in this country, which has but recently been completed by Dr. Packard, under the title of "A Guide to the Study of Insects." This work is an honor to the Academy as the production of one of its officers, and will accomplish much towards placing the study of Entomology on a firm basis in this country.

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* Mr. Hyatt's notes on this animal are given in the Appendix to this Report.

Dr. Packard has just left for a short trip to Key West, Fla., where he proposes to dredge and make collections in his favorite departments, which, undoubtedly, will prove of much interest.

What little time I have been able to take from business has principally been devoted to a study of the anatomy of the young of *Orthagoriscus*, and the preparation of a paper on the family to which this singular fish belongs.

The more immediate results of work accomplished during the year consist in the mounting of the specimens of corals and sponges by Mr. Hyatt and Mr. Bicknell. Mr. Bicknell has also made a number of preparations of insects for microscopical study.

Mr. Morse has mounted and labelled a large number of shells, and has also partly mounted the collection of dry Echinoderms and Starfishes on tablets, and has in part mounted and labelled the specimens collected from the shell-heaps, having already placed most of the collection of pottery on exhibition.

Mr. Hyatt has continued the rearrangement of the fossils, and has properly labelled and mounted the specimens from several of the lower formations. Mr. Hyatt has also placed many labels on the Ethnological specimens.

Dr. Packard has continued his work of arranging the insects, and several thousand specimens have been spread, labelled and placed in the cases.

A large part of the collection of Crustaceans has been identified by Mr. Sidney I. Smith of the Yale Museum.

Mr. R. E. C. Stearns of the California Academy of Science, a most valued friend of our Academy, has not only placed in our collection a large number of shells, but has kindly given many days' work to the identification of the species from the Pacific coast, during his recent trip to the east.

Mr. C. M. Tracy was employed during the early part of the year on the Herbarium and has named, catalogued and mounted the County plants and placed most of them in their proper folios and cases. He has also gone over the whole collection of dried plants, securing them from damage, and arranging them in the gallery of the anteroom of the Essex Institute.

Mr. C. A. Walker has rendered very important service in labelling the collection of Birds, Birds' Eggs and Mammals in the County collection. Mr. Walker and Mr. Newcomb have given assistance in spreading specimens of insects, and the curator of Entomology has also derived much assistance in this way from Mr. James Angus of West Farms, N. Y.

Mr. Cooke's duties have continued to be as multifarious as during the preceding year, and while he has had direct charge of the reception and delivery of all packages by express, and the entry and care of specimens received until they can be arranged in their respective departments, he has also been ever ready to give a helping hand to others, and there is not a department of the Museum that he has not materially aided in advancing. In fact, Mr. Cooke's labors for the Museum have always been of such a disinterested character, that while no particular department is directly under his charge, he has made himself a most valued officer to the Academy by faithfully performing the various duties constantly occurring in an institution of this character, many of which would be left undone were it not for his willingness to assume them.

Mr. West has of necessity been obliged to give nearly all his time to the rapidly increasing business of the *Naturalist* and *Naturalists' Agency.*

The publications of the Academy have been most favorably received at home and abroad, and have given the Academy a high and widespread reputation which it is most desirable to maintain. The publications of the leading academies and societies of Europe are now received regularly in exchange, and several learned bodies have sent us many volumes of their Transactions and Proceedings, and in some cases, even full series of their publications.*

The valuable volumes we are now receiving from scientific societies can but impress us with the absolute necessity of maintaining our own character as an "Academy of Science" in order to continue this connection with other institutions, and as this can only be done through the medium of our publications it thus becomes necessary at once to secure the means of regularly publishing the *Memoirs* that are offered and ready for the press. For while the monthly publication of the *Naturalist* is a constant reminder of the Academy, and is a voucher of what it wishes to do for the advancement of science, yet it alone is not enough to satisfy the just demands that science has upon us for other and higher attainments in her behalf.

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* Since this report was written, the ACADEMY OF LEYDEN has forwarded forty-two quarto volumes of its *Annals*, embracing the publications of this eminent society from the year 1815 to 1865. The SOCIETY OF NATURAL SCIENCES OF NEUCHATEL has sent a full series of its publications. Notice has also been received from the ROYAL SOCIETY OF LONDON that its Council has voted to send to the Academy several of the quarto volumes of *Philosophical Transactions* of the society as well as its *Proceedings*. Nor must I omit to mention in this connection the valuable donation made to the library by D. G. ELLIOT, Esq., who has made the Academy the recipient of a copy of his large and beautiful folio work on the Grouse family.

The *Naturalist* has continued to hold its position as a popularizer of science, and has been most cordially received by contemporaneous journals. It has also received the hearty approval of all the distinguished men who have done so much in developing natural science in this country, either by their own scientific labors or fostering care, and, though it still lacks the large popular subscription list which would render it self sustaining, we cannot complain of its want of support; while, from its very nature, its influence on the people must be a gradual one, and to a certain extent the desire for such a journal has to be formed by the magazine itself. But the seed has now been spread broadcast over the land, and all we can hope for is that, by diligent cultivation on our part, the fruit will gradually ripen and be gathered by the many. In connection with the *Naturalist*, there has been established a *Naturalists' Agency* for the sale and publication of books and pamphlets relating to Natural History.* This agency has

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*The following copy of a circular, issued by the Agency, gives its general objects and character.

The Naturalists' Agency. Owing to the many letters which we receive requesting information about obtaining books and papers on topics of Natural History, we propose to establish an agency at the office of the *American Naturalist*, for the purpose of supplying Naturalists with books and pamphlets, and aiding authors and institutions in selling their various publications, on the following plan:—Parties to send to us several copies (not exceeding twenty, unless specially requested) of each book or pamphlet they have for sale, stating the *retail price*. An account will be opened with each party sending, and credit given at the retail price for all books received. Parties will be charged on their accounts for any transportation expenses which we have to pay on receiving the packages, which should be sent to us by mail (prepaid) when not too bulky. A classified list of the books will be given in the *Naturalist*, with the prices of each annexed, and the amount to be remitted in addition for postage.

During the month of January, in each year, the accounts of each party will be made up, and a statement forwarded regarding the number of copies on hand, and the sales that have been made, for which the cash will be remitted after deducting any express charges incurred on the receipt of the books, and twenty per cent. from the amount received, to defray the expenses of the advertisement, etc.

Parties having works on Natural History which they wish to dispose of, can send them to us on the same terms; or if very valuable and expensive books, they can forward a list only, and not send the books until we order them. We will, also, give in our list notices of the various Scientific Periodicals, and the regular publications of Scientific Societies and Institutions on the same terms, deducting twenty per cent. from all sales made. It will be part of the business of the agency to pro-

proved a most decided success, and from a large number of letters received, is now known to be the very medium wanted by both authors and students. The great want which we have thus supplied by establishing the agency can best be appreciated by my stating that though it is yet only in its infancy, and hardly known outside of the readers of the *Naturalist*, yet it has already sold books for authors and institutions amounting to over $3,000, besides publishing the *Guide to the Study of Insects*, for the author. I may here add that it is to the agency that we hope to look for great future aid in carrying on our publications.

The last annual *Report* has been sent, in the name of the Academy, with copies of the first *Memoir* and full sets of the *Naturalist*, to all the leading scientific societies in the world, and the Academy is under great obligations to the Smithsonian Institution for the favor of transmitting its publications to foreign institutions through its agency, and the receipt of the publications of foreign societies, free of all expense, except express charges between Washington and Salem.

The contemplated withdrawal of Mr. Morse, at the close of this year, as a paid officer of the Academy, is to be regretted, as it will leave the large and rapidly increasing department of Mollusca without a special curator in constant charge, and the Academy will lose the assistance of an efficient officer. It is the intention of Mr. Morse to devote such of his time as it may be possible for him to work on the collection; but with the best of intentions on his part we can but feel alarmed for the further arrangement of the Mollusca, until another worker in that department is secured.

I herewith submit the reports of Messrs. Hyatt, Packard, Morse and Cooke as part of this report.

Respectfully submitted to the Council,

Peabody Academy of Science, F. W. PUTNAM,
Salem, December 25, 1869. *Director.*

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cure, if possible, any works on Natural History, other than those on its list, that may be ordered.

To Institutions and Societies publishing Proceedings, Transactions, Memoirs, etc., we believe this agency will be of great benefit, and authors having extra copies of their own papers for sale will undoubtedly find it to their advantage to thus make their papers more widely known. As we shall confine our agency to works on Natural History, parties are specially requested not to forward any books or papers that do not relate wholly or in part to some one of the following departments:—Mineralogy, Geology, Palæontology, Botany, Zoology, Microscopy, Archæology, and Ethnology. In order that packages intended for the agency should not, by mistake, get into our library, it is specially requested that all such packages be addressed as follows:—*American Naturalists'* Agency, Salem, Mass., [Signed] Editors of the *Naturalist*.

REPORT ON GEOLOGY.

No important additions or changes have been made in this department during the past year, partly from want of room and partly because very little of the Curator's time could be expended on this section of the Museum.

There are two methods of increasing the collection in a manner consistent with the wants of the Academy. One is by the purchase of a series of such specimens as would be of importance to the general geological arrangement, and the other by the labors of those who may be more or less interested in the Geological Survey of the county.

The latter seems the only way which is now opened to the Academy, and the Curator is pleased to announce that an auspicious beginning has already been made.

During, and subsequent to, the meeting of the American Association, Dr. T. Sterry Hunt made investigations, the value of which, as regards our future labors, can hardly be overestimated.

Some two years since, Mr. Bicknell examined the Newburyport limestone with a view of detecting in it traces of Eozoon, but failed in doing so. Dr. Hunt's visit to Newburyport, however, renewed the general interest in the subject and caused a reëxamination to be made which finally resulted in the discovery of undoubted traces of Eozoon.

It is but just, however, to state that this desirable result was not attained until Mr. Bicknell again visited the quarries and personally selected specimens, those collected previously having in every case proved barren.

A. HYATT, *Curator.*

REPORT ON PALÆONTOLOGY.

Since the last Report the specimens of this collection from the Potsdam to the Chemung Group have been reviewed, rearranged and labelled in a general way, according to the arrangement proposed in the provisional plan of organization contained in the last Annual Report.

The specimens from the Potsdam sandstone to the Trenton inclusive, have been mounted, labelled and arranged in their cases, only typical species, however, being allowed to remain on exhibition. Every specimen *not* representing some characteristic species or genus which lived during these successive periods, has been carefully excluded and placed in drawers.

The Curator has purposely left these unmounted and in their original card-board trays, that they may be more serviceable for study and examination.

The amount of shelf-room gained by this process of elimination, has been thus far rather more than half of the space originally occupied by this part of the collection.

The different genera are sufficiently separated by blank spaces, so that each can be distinctly seen, and general ideas of the peculiar forms which distinguish each geological period and epoch, can be formed with a readiness unattainable by any other system of arrangement.

The department is indebted to the *American Naturalist* for a large number of Professor Ward's series of casts, including a fine cast of Plesiosaurus.

A. HYATT, *Curator.*

REPORT ON ETHNOLOGY.

This department has been reviewed by the Curator and the prominent specimens and alcoves labelled.

These labels are sufficiently numerous in each series to give the visitor an opportunity of studying the various modes of dress, and the implements and weapons which are characteristic of different tribes or nations.

The most valuable addition to this department during the past year, consisted of a collection of Roman vases presented by Mr. Stetson of New York, through Mr. Stone.

The list of single donations, all of which are very acceptable to the Museum, will be found in the general list.

A. HYATT, *Curator.*

REPORT ON THE ARTICULATA.

The work during the past year has been a continuation of that of the preceding, namely, that of placing on exhibition the entomological collection without spending any time in identifying species or verifying those already named. The Curator has continued the work of arranging the moths. Mr. T. Reakirt has named a second collection of Nicaraguan butterflies, and a very large collection of moths from California, Australia and New Zealand has been received from Mr. Henry Edwards of San Francisco, in exchange.

A typical collection of Diptera, and of Coleoptera as far as and including the Scarabæidæ, has been arranged in the cases. Baron Osten Sacken has kindly labelled some of the galls, forming a portion of the economical collection.

Mr. E. Bicknell is engaged in mounting on glass slides, wet preparations of the Lice, which will, it is hoped, afford good material for the study of this group of Hemiptera.

The Neuroptera have been arranged in the cases. Quite a large amount of room has been given up to the collection of specimens illustrating applied, or economical Entomology, embracing specimens of insect architecture, insect products, such as galls, silk cocoons, and specimens illustrating the ravages of noxious insects. It is to be regretted that there is not more room to devote to this department.

Mr. S. I. Smith, of the Sheffield Scientific School, has kindly identified the McNiel collection of Decapodous Crustacea from the west coast of Nicaragua, and all the others in the Museum, so that a catalogue can soon be printed if thought desirable.

The Curator has been assisted by Mr. C. A. Walker, Mr. James Angus and Mr. R. Newcomb, in the arrangement of the insects.

A. S. PACKARD, Jr, *Curator.*

REPORT ON THE MOLLUSCA.

During the last official year the Curator's time has been equally divided between the Academy and the Boston Society of Natural History. Work has been continued on the general collections, and a few special collections have been mounted, among which may be mentioned a fine collection from Florida presented by R. E. C. Stearns, Esq., to whom the Academy is already indebted for previous additions to its Museum, and a large collection from W. Harper Pease, consisting of small species from the Sandwich Islands.

All the collections of Massachusetts duplicates have been gathered together and arranged in lots for convenient exchange. A considerable time has been spent on the McNiel collection from Central America, in which the Curator has received valuable assistance from Mr. Stearns and Mr. Cooke.

For the donations to the department I refer to the general list.

E. S. MORSE, *Curator.*

REPORT ON THE RADIATA.

The collection of Corals has been reviewed and mounted by Mr. Hyatt, aided by Mr. Bicknell, who provided proper wooden tablets for the specimens, except the Gorgonians and many of the branching Madrepors which he mounted on plaster stands. Thus nearly all the specimens are exhibited in their natural upright positions, and the display of Sea Fans is especially fine. The specimens are all numbered and catalogued, and ready for labelling.

The Curator has mounted the dry Echinoderms on tablets and they are now on exhibition in the central gallery case. The duplicates of the dry Echini and corals have been separated from the collection. The alcoholic specimens were previously labelled and arranged in the central gallery case.

E. S. Morse, *Curator.*

REPORT ON THE PROTOZOA.

The Sponges have been mounted in a manner similar to the corals, by Mr. Bicknell and the Curator.

The department has been increased by a series of casts from Professor Ward, consisting of two hundred specimens of thirty different genera of Foraminiferæ. These were obtained through the *American Naturalist.*

These casts will eventually prove of much value, especially in illustrating lectures, since most of the Foraminiferæ are microscopical, of which these casts are enlarged copies in plaster.

A. Hyatt, *Curator.*

THIRD ANNUAL REPORT

OF THE

PEABODY ACADEMY OF SCIENCE,

FOR THE YEAR 1870.

SATURDAY, JULY 9, 1870.

ADJOURNED quarterly meeting.

Present, Messrs. Endicott, Wheatland, Goodell, Gray, Perkins and Peabody.

A letter from the Director, relating to the publication of the Memoirs, having been received, it was voted that the papers by Messrs. Putnam and Packard, named in the letter, be published on the terms therein stated.

A communication was received from the Council asking for the concurrence of the Trustees in the following change of the By-laws.

That the last line of section VII. of the By-laws be so amended as to read, "Three members of the Council shall form a quorum."

The proposed amendment was adopted.

A letter from Mr. Hyatt to the President of the Board, tendering his resignation as a Curator of the Academy, was read by the President, whereupon it was voted that the Trustees accept the resignation of Mr. Hyatt, and desire the President to address a letter to him, expressing the regrets of the Trustees that he can no longer be an officer, and their great indebtedness to him for his labors in the Academy.

Voted, That the sum of ten thousand dollars be loaned to the proprietors of the *American Naturalist* upon such terms as shall be agreed upon by the Finance Committee.

Voted, That the Secretary be added to the Finance Committee during the absence of Mr. Russell.

SATURDAY, JANUARY 7, 1871.

The annual meeting of the Board of Trustees was held this day.

Present, Messrs. Endicott, Wheatland, Goodell, Nichols, and Perkins.

Voted, That this meeting adjourn to meet on Friday, the thirteenth instant.

FRIDAY, JANUARY 13, 1871.

Adjournment of the annual meeting.

Present, Messrs. Endicott, Wheatland, Goodell, Nichols, and Peabody.

Report of the Council for 1870 was read, accepted, and ordered to be printed.

Report of the Treasurer was read, accepted, and ordered to be printed.

The following officers were elected for the year ensuing and until others shall be chosen in their stead.

President. — WILLIAM C. ENDICOTT.
Vice President. — HENRY WHEATLAND.
Secretary. — ABNER C. GOODELL, JR.
Treasurer. — JAMES R. NICHOLS.

Executive Committee.—William C. Endicott, Henry Wheatland, Abner C. Goodell, Jr., James R. Nichols, and Henry C. Perkins.

Finance Committee.—William C. Endicott, James R. Nichols, and Abner C. Goodell, Jr.

The appropriations for the year were made.

Adjourned.

REPORT OF THE COUNCIL FOR 1870.

To the Trustees of the Peabody Academy of Science:

Gentlemen: In accordance with the vote of the Council, I have the honor to transmit, for your consideration, the accompanying documents as the Annual Report of the Council to the Board of Trustees of the Academy.

Respectfully,

A. S. Packard, Jr.,

Secretary of the Council.

Salem, Dec. 31, 1870.

ABSTRACT FROM THE RECORDS.

Regular meetings of the Council were held on March 26, May 29, June 25, September 24 and December 31, 1870. At the annual meeting Mr. Packard was elected to the office of Secretary of the Council. No other business out of the regular routine was transacted that is not covered by the Annual Report of the Director, or by communications already made to the Board of Trustees.

A. S. Packard, Jr.,

Secretary of the Council.

REPORT OF THE DIRECTOR FOR THE YEAR 1870.

THE appearance of this year's report, under the same cover with that of 1869, renders it unnecessary for me to enter into many details of work accomplished, as a large portion of the year has been spent in a continuation of the various operations mentioned in course of progress in my last report. There have been, however, several changes in the internal organization of the portion of the Academy placed under the supervision of the Director, that make it necessary for me to call the attention of the Council to certain conditions now existing, and to suggest a method of overcoming difficulties in the future management of the Museum, and to these I request the earnest consideration of the Council.

As was anticipated in my last report, the withdrawal of the Curator having the Mollusca under his charge as a paid officer of the Museum, has been most detrimental to that department, nothing having been done in it during the year. This department demands active work from some competent malacologist to place it in a creditable and instructive condition, and complete the arrangement commenced by Mr. Morse.

The resignation of the Curator of the departments of Geology and Palæontology in May last, in order to accept the appointment of Custodian of the Boston Society of Natural History, has left these departments in an incomplete condition of arrangement, which is very much to be regretted, as Mr. Hyatt had commenced the arrangement of the specimens on a plan which, when perfected, would have formed a most instructive department of the Museum.

The interesting and important osteological collection has never been more than temporarily arranged and several skeletons of the larger animals, which have been carefully prepared during the past few years as occasions offered, have not yet been placed in the Museum. To properly mount the skeletons and arrange the present specimens in an instructive manner, the labor of a competent osteologist is required.

With the exception of these three departments, and that of the minerals, which remains as previously reported, slow but constant preparation of the specimens has been going on, and the work accomplished has been all that could be expected from the reduced corps of workers. The collections that have been the most rapidly forwarded are those of the articulates, under the management of Dr. Packard, and the archæological, principally by Mr. Cooke's labors.

Accessions of specimens in all departments have been received from one hundred and forty-eight donors, and embrace one hundred and ninety-five distinct donations during the past year. Though these could not always be put in their proper places in the Museum, they have, nevertheless, been properly cared for and safely stored to await the event of some opportunity for their final disposition.

In the work of identification of specimens, the Academy is greatly indebted to Professor E. D. Cope, Dr. J. L. LeConte, and Dr. G. H. Horn, of Philadelphia; Messrs. G. D. Smith and F. G. Sanborn, of the Boston Natural History Society; Professor A. E. Verrill and Mr. S. I. Smith, of the Sheffield Scientific School; and Professor H. Hagen, of the Museum of Comparative Zoology.

During the latter part of the last year and the first of the present, Dr. Packard spent about six weeks in exploring the shores of Key West, and the Tortugas, Florida, making large collections of crustacea, especially the smaller forms, worms, and radiates, besides other animals. While at Key West he was greatly indebted to Mr. M. C. Allen for continued aid and facilities, to whom much of the success of the expedition was due. He is also indebted to Professor H. H. Goodell of Amherst, who accompanied him on the trip, for continued favors and constant aid. During his stay of about ten days at Fort Jefferson, Tortugas, he experienced the kind hospitality of Col. Charles Hamilton, late of the Volunteer service, and the officers of the garrison. To Col. Gibson, the Commandant of the post, Quartermaster Pike and the other officers of the garrison, he is indebted not only for the use, almost daily, of a boat and crew, but for continued aid in his explorations. To Mr. Charles Mallory, proprietor of the New York and Galveston line of steamers, the Academy is indebted for a reduction of fare from New York to Key West, made in favor of Dr. Packard.

During May last, Dr. Packard, in company with Mr. Morse, made a fortnight's trip to Fort Macon, Beaufort, N. C., where they enjoyed the hospitality and constant aid of Dr. Elliott Coues, U. S. A., Surgeon of the post. Large collections of crustacea, worms, mollusks and radiates were made, being a most important addition to the Museum, and with the collections from Florida form rich material for comparison in the study of our local invertebrate fauna. At Fort Macon, as at Fort Jefferson, most essential and ready aid was granted by the officers of the U. S. garrison. Col. Joseph Stewart, in command, was most attentive and obliging, and besides granting the daily use of a boat and crew, he personally, with the other officers of the garrison, rendered most efficient services in the collection of specimens, which are duly acknowledged in the general list of donations.

I wish also to call attention to the important collection of fishes in alcohol made by Dr. Coues at Fort Macon and presented to the Academy. Nor can I pass unnoticed the valuable collection of minerals and ores from Lake Superior, made by Mr. Daniel Beaser of Ontonagon, and by him presented to the Academy through the kindness of Henry Gillman, Esq., of Detroit.

The present condition and reduction of the working corps was anticipated from the first organization of the Academy, unless active measures were taken to secure the undivided services of all the officers. The means of the Academy from the first have not been sufficient to carry out the great work which its honored founder designed in general terms for it to accomplish; he not fully appreciating, nor indeed could any one foresee, the responsibilities that were from many causes gradually developed which the Academy had to assume. It was therefore found necessary to employ officers either at such low rates of compensation, or for such small part of their time, as to place them more in the light of benefactors to the Academy than as servants for the fulfilment of duties incumbent upon them. This condition of things has been, and always will be, most detrimental to public institutions, and though it could. not have been avoided at the commencement, it is one which, though not yet wholly removed, I trust will not have to be much longer maintained by the Academy, and unless the officers hereafter can be so compensated as to devote their whole time to the Academy, experience has taught that it will be far better to leave the curatorships vacant and trust to arrangements with competent persons for the performance of special duties.

Under these considerations I wish to ask for the adoption of a plan allowing the Director to enter into arrangements, subject to the general approval of the Council, by which competent persons may be induced to undertake the arrangement of various groups of specimens, or departments of the Museum, as temporary assistants. Skilled labor can be obtained in several departments, and though it would be impossible to secure parties to accomplish all the work desired in one year, even if the means were at our disposal, still, by taking advantage of opportunities as they occur, much can be accomplished with the present limited means.

Should these views meet the approval of the Council, and be sanctioned by the Trustees, I would suggest that the appropriations for the coming year be in accordance with the estimates accompanying this report. Small as some of the sums for special purposes may seem, I believe that most satisfactory results will be secured from their expenditure in the manner suggested.

There are two other important matters for the consideration of the Council, the conditions of which have been in some degree altered by the changes which have taken place in our working corps. These are the Scientific Survey of the County, and the Lecture system. In order that a beginning shall be made in the former, it will become necessary to provide a fund for the purpose of carrying out the investigations in the field and the publication of the results. Until this is done, all we can hope to accomplish is the preparation of reports on a few of the departments by the present officers. In regard to the lectures, it is proposed that the Academy make such arrangements with a few scientific men as will secure their services as lecturers, at certain fixed compensation for each lecture they may deliver in the courses of the Academy, and that notice be given that the Academy is prepared to furnish a certain number of lectures in various parts of the county during the coming year, on certain conditions relative to the nominal expenses of the same. From applications that have been made I think this course would meet with favor and be productive of satisfactory results in the county. It would also be very desirable to devote a certain hour each week, to an informal lecture, or explanation of particular portions of the Museum, of which public notice should be given.

The number of visitors to the Museum has been on the increase during the past year, which is very conclusive evidence that it is a popular place of resort for our citizens and strangers. The number of persons who have visited the Museum since it was first opened to the public in May, 1869, is 63,993; of this number 37,865 have been admitted during the last year; an average of 150 persons for each day that the Museum has been opened to the public during the year. Until May last the Museum was open to the public four days each week; at that time the City Government allowed us a special constable for an additional day, and the Museum has since been opened to the public on all days except Sundays and Mondays, the last being necessarily reserved for cleaning day. But slight damage has been done to the hall or the specimens, further than that caused by the dust penetrating the cases and settling on the specimens, which, in a public museum, unless the building and cases are erected in a special and very costly manner, will always be a great and unavoidable evil. A few instances of broken glass in the cases have occurred, but these have fortunately not caused damage to the specimens, and generally the persons causing the mishap have acknowledged it.

I am sorry to report that two small thefts have occurred, both by boys, and though of small pecuniary value, it has caused the exclusion of a certain class of boys from the Museum who would otherwise have been allowed entrance. In this connection I wish to again call your attention to the suggestion made in my last report of placing the constable of the hall in police uniform.

The exchange of publications has been continued with other institutions during the past year, and has resulted in securing many valuable works for the library of the Academy. These have been acknowledged in the *Naturalist*, and it is therefore not necessary to recapitulate them, but I should be wanting in courtesy not to mention the many valuable volumes received from the *Academy of Leyden; Society of Natural Sciences of Neuchatel;* and the *Royal Society of London*, referred to in my last report, and to specially call your attention to the important series of transactions and other publications received from many foreign societies, among which are the *Royal Zoological Society*, "*Natura Artis Magistra*," Amsterdam; *Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique; Royal Northern University*, Christiania; *Institut National Genevois; Société de Physique et d'Histoire Naturelle*, Geneva; *Royal Danish Scientific Association*, Copenhagen; the *Entomological Societies* of London and Paris; *Royal Academy of Science*, Munich; and also from the *Royal Geological Survey of Austria*. The *Naturalist* and the second *Annual Record of Entomology* have been sent to the various journals and institutions with which we are in regular exchange, and we are again greatly indebted to the Smithsonian Institution for the facilities granted for this purpose.

The *Naturalist* has continued to be received with great favor, and it is thought that the increased facilities for its publication will render it hereafter nearly self-sustaining.

A large number of books and specimens have been received by the Academy through the medium of the *Naturalist* during the past year, and considerable time has been given by the editors to answering letters of inquiry on almost every conceivable topic of Natural History. Many of the inquiries have been answered in the pages of the magazine, but a far greater number have been answered directly by letter. In many instances the questions asked have been such as to demand special investigation and comparison before proper replies could be made, and though much time of the officers has been consumed in this way, still it has been deemed a legitimate duty, for these answers have probably advanced the cause of science by the correction of errors, the identification of specimens, and by giving young investigators such directions in their studies as would produce sounder results than could have been obtained by following their own inclination without seeking for advice. Many of the questions asked of the *Naturalist* have been of a character which the editors were not prepared to answer; such cases have been referred to competent authorities and have been most cordially answered. For these favors the editors have been under great obligations to Professors Gray and Wyman, and Mr. Allen, of Cambridge, to Mr. J. L. Russell of Salem, and Mr. C. M. Tracy of Lynn, and other gentlemen who have been occasionally called on, all of whom have received the requests with the true scientific spirit which is ever ready to aid others in the paths of research.

The work of the *Naturalists' Agency* has been rapidly increasing during the last year, and from this the Academy is indirectly receiving much credit and advantage.

The importance of a State Entomologist was alluded to in my last report; since then the State Board of Agriculture has appointed Dr. Packard as Entomologist to the Board. In this capacity he will prepare an annual report on our injurious insects which will be a valuable contribution to the agricultural interests, and will aid the Academy in its work of diffusing knowledge in our community.

Several special papers, in part intended as the appendix for the last report, are herewith submitted for publication as the appendix to the REPORTS of 1869 and 1870, and the two reports of Mr. Cooke on the additions to the Museum have been incorporated into one.

Respectfully submitted,

F. W. PUTNAM, *Director*.

Peabody Academy of Science,
Salem, December 31, 1870.

REPORT OF THE TREASURER FOR 1869-70.

THE Treasurer submits the following report for the two years ending January 15th, 1871.

The Permanent Fund remains at $100,000.

At the date of the last report, the estimated outstanding indebtedness was $3,600, which has been paid since then. To do this, and to meet other accruing expenses necessary for the proper arrangement of the Museum, it was thought best to borrow money, and a temporary loan of $4,900 was effected. This still remains unpaid, and together with amounts due on unadjusted accounts, makes an aggregate indebtedness of $5,400.

The appropriations for the ensuing year have been made with a view to pay this sum at as early a day as is practicable without seriously impairing the interests of the Museum, and it is believed that at the end of two years from this time the institution will be wholly free from debt, and that the whole income of about $9,000 per annum, may then be devoted to the purposes set forth in the Instrument of Trust.

The following account exhibits the receipts and expenditures since January 15th, 1869, the date of the last report.

Cash on hand Jan. 15th, 1869,		$ 528 32
Income from Jan. 15th, 1869, to Jan. 15th, 1871,		18,077 82
Borrowed of Salem National Bank,		4,900 00
		$23,506 14
Museum account,	$17,599 56	
Construction,	754 78	
Interest on Loan,	679 75	
Taxes,	754 00	
Insurance,	490 00	
Watchman,	593 14	
City of Salem for sewer,	136 95	
Treasurer's Clerk,	600 00	
Repairs on Hubon House,	126 28	
Repairs on King Building,	242 86	
Fuel,	274 00	
Aqueduct,	71 70	
Expense of Trustees,	84 50	
Institute Press,	135 75	
Cloth for draping building,	211 13	
Thorner, care of King Building,	48 00	
Salem Gas Light Co.,	18 20	
Curtains for Hall, etc.,	100 80	
Repairs on Marine Building,	90 39	
Incidental Expenses,	475 96	
Cash on hand,	18 39	
		$23,506 14

S. ENDICOTT PEABODY, *Treasurer*.

Salem, Jan. 15th, 1871.

APPENDIX TO THE REPORTS OF THE DIRECTOR FOR 1869 AND 1870.

Note on Rossia palpebrosa Owen (?). By Prof. A. HYATT.

THE animal was obtained at Manchester from the stomach of a Hake, and was partly decomposed. The generic characteristics, however, could be made out without difficulty. The length from the bases of the arms was about two inches, the head about half an inch from the edge of the mantle to the base of the arms on the dorsal side. The edge of the mantle was not connected dorsally as in Sepiola, but was open all round, as in Rossia. The mantle had the usual fusiform outline very slightly bulging near the base, owing to the numerous eggs with which the lower half of the abdomen was distended. The proportions of the longer arms, about equal to the length of the head and body together; the length of the arms among themselves, they being about as one, two, four, three, reckoning from the back pair on either side; the shortness of the sessile tentacles, which were not much above half an inch longer than the third pair of arms, are all characteristic, and point to a close affinity if not absolute identity with *Rossia palpebrosa*, an Arctic form described by Professor Richard Owen in the Natural History of Ross' voyage.

A captain who had been long engaged in the coast fisheries told me that this species was common off the coast, and could be readily enticed to the surface with bait and caught with a landing net. He had used them successfully for bait. It seems singular that so common an animal should have escaped notice, and as an addition to our fauna it is very important. Only four genera have been hitherto commonly found on the coast including the Spirula, which must be considered as a very doubtful member of our fauna, the whole evidence of its existence in the vicinity depending upon shells that have been so long in the water that no animal matter is even found attached to them. All the other genera are more or less nearly allied long, lanceolate forms with solid, horny shells imbedded in the back, whereas this belongs to the smaller purse-like forms, which possess little or no bone in the back. Unfortunately this pen, as it is called, was drawn out, and its minute size caused it to be overlooked and lost in changing the specimen from one bottle to another. It reached from the mantle margin nearly half way down the middle of the back.

The fins were situated on the anterior half of the back, but were too much decayed to present other reliable characteristics.

Catalogue of Batrachia and Reptilia obtained by J. A. McNiel in Nicaragua. By Professor E. D. Cope.

CROCODILIA.

547.[*] *Crocodilus acutus* Cuv. (*C. Americanus* Seba.)

LACERTILIA.

548. *Iguana rhinolopha* Wiegm.
549. *Cyclura pectinata* Wiegm.
550. *Cyclura acanthura* Wiegm.
551–2. *Sceloporus siniferus* Cope. Proc. Am. Phil. Soc., 1869, p. 159.
559. *Sceloporus* sp. alt. *pullus.*
556. *Anolis cupreus* Hallowell. Proc. A. N. Sci. Phila., 1860, p. 481.
558. *Anolis longicaudus* Hallow., l. c., p. 481.
553. *Stenodactylus fuscus* Hallow.
554. *Stenodactylus albigularis* D. B.
560. *Phyllodactylus tuberculosus* Wiegm.
561–2. *Mabuia unimarginata* Cope.
555. *Amiva pulchra* Hallow.
563–4. *Tretioscincus lævicaudus* Cope. Sp. nov.

Scales large, those of both body and tail, entirely smooth. Several behind the occipital plates larger than the others. Limbs short. Size about that of the *T. bifasciatus.*

Color, a dark clear olive above; paler below, a light green band from the temporal region along the canthus rostralis to the end of the muzzle, and another parallel along the upper lip. No other markings.

From Occidental Department, Nicaragua.

This Ecpleopod, differs from its congener *T. bifasciatus* Dum. in the absence of carinæ on the caudal scales, and in other points, and in the coloration.

OPHIDIA.

530. *Boa eques* D. B.
546. *Enulius murinus* Cope. Gen. et sp. nov.

CHAR. GENERICUS. Palatine, pterygoid, and anterior portion of maxillary bones edentulous; a long, strong, grooved tooth on the posterior part of the maxillary bone. Internasal plates present; rostral prominent, depressed; two distinct nasals, a loreal, no preocular, postoculars. Scales smooth, with one apical pore-pit. Anal plate two, and subcaudals double.

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[*] These numbers are those under which the specimens are entered in the Catalogue of Reptiles in the Museum of the Academy, and are also those under which specimens from the collection have been distributed.—F. W. P.

This genus has head-shields arranged like those of *Rhegnops* Cope (Proc. Acad. Nat. Sci., Phila., 1866, 128), but the dentition is entirely distinct. It is nearer to *Tantilla* B. G., but that genus does not present the edentulous characters, and exhibits a preocular instead of a loreal plate. The pupil is round. The general form is slender for a Calamarian serpent, and the tail is unusually elongate; the head is not distinct.

CHAR. SPECIFICUS. Scales in sixteen or seventeen rows. Labials $\frac{7}{6}$ third and fourth in orbit. Two postorbitals; temporals 1, 2, 3. Rostral broad, crescent-shaped; internasals half as large as prefrontals. Frontal nearly triangular, with apex behind; anterior border strongly convex. Superciliaries sub-triangular, with short apex anterior. Occipitals elongate. Geneials, one pair followed by a row of three scales. The tail measures between one-third and one-fourth of the total length, nearer one third, but the only specimen now by me, has the extremity mutilated. Gastrosteges 216. Length of a specimen, .220^{m}; other large ones are not now before me.

Color; mouse-color above, white below; a pale spot on each nasal plate and a dusky one on each side, behind the rictus oris.

From Chinandega, Occidental Department, Nicaragua, discovered by J. A. McNiel. Several specimens were taken from a well forty feet deep.

This species in scutellation and form of head, is related to the Calamarinæ, and it is doubtless a burrower, but its scale-pores, and long tail, are exceptional features.

545. *Tantilla melanocephala* Schl.
543. *Conophis lineatus* D. B.
531. *Xenodon angustirostris* Peters.
542. *Leptodira annulata* Linn.
536. *Leptodira mystacina* Cope. Proc. Am. Phil. Soc., 1869, p. 151.
528. *Spilotes auribundus* Cope (*S. Salvini* Gthr.).
544. *Spilotes melanurus* D. B.
538. *Masticophis margaritiferus* Schl.
541. *Thrasops Mexicanus* D. B.
540. *Oxybelis acuminatus* Wied.
535. *Himantodes* sp.
534. *Leptognathus anthracops* Cope. Proc. Acad. Nat. Sci., Phila., 1868, p. 136.
537. *Leptognathus nebulatus* Linn.

532. *Elaps nigrocinctus* Gird.
533. *Ancistrodon bilineatus* Gthr.
529. *Caudisona durissa* Laur. (*C. horrida* D. B.).

TESTUDINATA.

565. *Chelopus rubidus* Cope. Proc. Am. Phil. Soc., 1869, p. 148.
566. *Kinosternum Mexicanum* Lec.

BATRACHIA.

568. *Bufo agua* Daud.
567. *Hyla Staufferii* Cope. Proc. A. N. Sci., Phila., 1865, p. 195.
569. *Siphonops Mexicanus* D. B.

In all thirty-seven species.

Catalogue of Reptilia and Batrachia obtained by C. J. Maynard in Florida. By Professor E. D. Cope.

Eutænia Sackeni Kenn.
Cyclophis æstivus Linn.
Sceloporus undulatus Linn.
Anolis principalis Linn.
Plistodon lineatus Linn.
Plistodon onocrepis Cope, sp. nov. (See below.)
Oligosoma laterale Say.
Hyla lateralis Daudin.
*Engystoma Carolinense** Holbr.
Plethodon glutinosus Green.
Manculus remifer Cope, sp. nov. (See p. 84.)

PLISTODON ONOCREPIS Cope.

Scales in twenty-two longitudinal series of nearly equal size, and sixty-four transverse, from the parietal plates, to opposite the posterior margins of the femora. Supranasal plates broad, internasal broad as long, large, in contact laterally with the prefrenal. Frontonasals long as broad, not in contact medially; frontal elongate. Su-

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*The *Systoma (Engystoma) ustum* Cope (Proc. Ac. Nat. Sci., Phila., 1866, p. 131) has been recently described by Peters (Monatsber. Berlin Academie, 1869, p. 881) as *Engystoma Mexicanum*.

perciliaries only three, the anterior longer than the other two. Interparietal wide as frontal, as long as from the frontal to the end of the muzzle. A pair of transverse postparietals. Eight superior labials; eye over fifth and sixth; sixth and seventh higher than long. One prefrenal which is higher than long; postfrenal longer than high. Two transverse chin-plates besides the symphyseal.

The general form is slender, but not so much so as that of the *P. egregius*. The toes are slender, the fifth posterior intermediate in length between the first and second. The hind leg applied forward two and three-fifths times reaches the ear, and three times, to the end of the muzzle. The fore limb extended forward, reaches the rictus oris.

Auricular meatus of usual size; eyelids normal; nostril in centre of nasal plate. The tail is stout and somewhat flattened above; it has been reproduced in the only specimen I have seen.

Color above, dark brown, darkest on the edges of the scales. The sides of the body are a shade darker, the tail paler. A narrow light band extends around the rostral plate on the canthus rostralis and superciliary margins on each side. On the scales it is constituted of a pale dot on the centre of each, and these gradually fade, so that the band disappears above the axilla. In passing from the rostral plate it expands on the frontonasals giving a horse-shoe shaped figure. The superior labials are entirely white, with some interruptions behind, which color is continued over the auricular meatus as a narrow line to above the axilla. No lines on body, limbs, or tail. Below, uniform white; tail straw colored.

Length to auricular meatus, .007^{m}; to vent, .039; to end of tail (reproduced), .075; width of head, .004; of sacral region, .0035; length of hind foot, .006.

This delicate lizard is allied to *P. egregius* Baird, but is easily distinguished by the few supraorbital plates, equal dorsal scales, and the coloration. In the latter respect it is less ornamented. The limbs are longer.

One specimen was obtained at Dummett's Plantation, Florida, by Mr. Maynard, for the Museum of the Peabody Academy of Science.

MANCULUS Cope.

Proceedings Academy Natural Science, Philadelphia, 1869, pp.95, 101.

Tongue free all round, boletoid. Toes 4-4. Parietal bones ossified, and without fontanelle. Premaxillaries coössified.

This genus only differs from Spelerpes in the absence of a digit from the hind foot, standing thus in the same relation to it that Hemidactylium does to Plethodon. Its only species was formerly referred to Batrachoseps, but besides the great difference in the tongue, the latter has a parietal fontanelle, and lacks the prefrontal bone. The latter point is indicated by Eschscholtz in his Atlas. In the present genus that bone is present.

The two species, as yet known, have a limited distribution. They are the smallest North American Salamanders.

They are distinguished as follows:—

Tail stout, compressed, body shorter by length of femur; black, sides light speckled. . . . . M. REMIFER.

Tail slender, cylindric, body longer, muzzle broader; yellowish, a dorso-lateral brown band. . . . . M. QUADRIDIGITATUS.

MANCULUS REMIFER Cope.

In this small salamander, the length to the fore limb enters that between the limbs but little over twice, indicating a less slender form than in the *S. quadridigitatus* of equal size. The head is an elongate oval, its width entering the length to the groin nearly seven times. There are sixteen costal folds, including the axillar, and these are continued upwards to near a median dorsal groove. The tail is deep and flat, and marked with the lateral intermuscular grooves, besides a strong median groove above. The latter gives way to a low fin on the distal half of the tail.

The limbs are short and weak; the posterior extends forwards over six grooves and half an interspace, the anterior over five and a half, including the axillar. The fingers are slender, the interior on both limbs quite short though distinct.

The vomerine teeth are in the two usual series, which are more posteriorly directed than is usual. The parasphenoid brushes cease far behind the first mentioned, and are in narrow, very convex brushes, which are distinct from each other throughout their length. The tongue is elongate oval.

The color is black above, and dark brown below; the black extends downwards and nearly meets round the neck below. Along the lower part of the sides of the head, body, and basal third of the tail, are dusted fine white dots.

	mm.
Length, axial, from end of muzzle to rictus oris,	.00375
“ “ “ “ “ “ “ axilla,	.0085
“ “ “ “ “ “ “ groin,	.027
“ “ “ “ “ “ “ end vent,	.03
“ “ “ “ “ “ “ “ tail,	.058
“ of fore limb,	.00575
“ “ “ foot,	.002
“ “ hind limb,	.007
“ “ “ foot,	.0028
Width of head,	.0038
“ “ body,	.0032
“ “ tail,	.002

Only one specimen of this species has come under my observation. It was found by Mr. Maynard, at Jacksonville, Florida, in February, 1869. It is preserved in the Museum of the Peabody Academy of Science.

From the form of the tail it is probably a more aquatic animal than its congener *M. quadrimaculatus*, and if the specimen be an average one, it is not quite so diminutive.

List of Insects collected at Pebas, Equador, and presented by Prof. James Orton. By Dr. A. S. Packard, Jr.

The few specimens here enumerated were presented to the Academy by Professor James Orton, of Vassar College. They were collected for him by Mr. Hauxwell at Pebas, Equador, about 2,000 miles from the mouth of the river Amazons. For aid in identifying the moths, I am indebted to Mr. F. G. Sanborn, of the Boston Society of Natural History.

LEPIDOPTERA.

Philampelus Anchemolus (Cram.). One specimen from Pebas does not differ from a specimen from "South America" (probably Brazil) in the Museum of the Boston Society.

Amphonyx Duponchel Poey. One specimen. It does not differ from a specimen from Cuba in the Museum of the Boston Society.

Attacus Amazonia n. sp. ♂. This fine species has unusually long and narrow wings, and is pinkish red, with the margin of the wings fawn brown; the two long, triangular, transparent spots on the fore wings are narrower than usual, and, with the front and inner sides, a little hollowed, the outer angle interrupting the outer line; the spots on the hind wings are large, oval, with the basal end suddenly truncated.

Body above and beneath, including the front of the head, pinkish red; a broad white band on the prothorax and at base of the abdomen; on the back of the abdomen is an oval, lanceolate, white ring, extending from near the base to the end of the abdomen; beneath is a lateral, double, white stripe, and two ventral white stripes. Legs brown. Fore wings more than twice as long as broad by the width of the body; pinkish red within the inner line, which is white within and blackish brown externally; the line is regularly curved, not angulated on the median vein, as usual, and almost touches the discal spot; the line ends upon the inner edge of the wing at nearly the same distance from the body as the costal termination of the line.

A broad, brick-red band, enclosing the large discal spot, crosses the middle of the wing. The outer line limiting this band is usually sinuate, the scallops being deeper than usual; the line is blackish brown within, and white without, the white portion being broadest in the scallops; the line from the costa to the discal spot, is much shorter than usual, being as long as the width of the discal spot on the hind wings. The discal spot is just twice as long as broad, being unusually long and narrow, the lower side being about twice as long as the inner and outer; the inner and upper sides are slightly hollowed out; the spot is narrowly edged with blackish brown. The wing beyond is pink red, with brown scales, but between the second and fourth subcostal venules there are ochreous scales, becoming thicker towards the submarginal line of brown patches; they also tinge the apical half of the outer margin, the posterior portion of the outer border of the wing having two rows of brown spots enclosing roundish clearer spots, some yellowish near the discal spot. The three black apical spots present in *A. Orizaba*, *Jorulla* and *Aurota*, are absent, the apex being pinkish and yellowish, with an irregular, white, thread-like line along the brown margin and disappearing before reaching the discal spot. Hind wings very long, produced posteriorly, extending beyond the tip of the abdomen to a distance equal to the entire length of the body. The inner line is plainly connected in front of the discal spot with the outer line; it is blackish brown, edged externally with white; the outer line is very deeply scalloped, the points being acute; it is interrupted by the discal spot. The discal spot is large, broadly oval, with the base square. There are two scalloped submarginal lines, the inner enclosing a row of oval brown spots, which increase in size towards the inner angle of the wing. Beneath, the wings are marked as above.

Length of body, 1.10 of an inch; of fore wing, 2.55 of an inch; expanse of fore wings, 4.70 of an inch.

This is a rather smaller species than *Attacus Orizaba*, *Jorulla* and *Aurota*, and belongs to a different section of the genus. It may be readily known by the very long and narrow, transparent discal spots on the fore wings; by the ochreous scales bathing the apical portion of the wing; by the absence of the usual three black apical spots; and by the suddenly truncated inner end of the discal spots of the hind wings. From Pebas on the Amazon; presented by Professor James Orton.

Zeuzera (Endoxyla Boisd.) *xylotribus* Herrich-Schæffer. Lep. Nov. 58, figs. 37, 38. Our male specimen from Pebas, differs from Herrich-Schæffer's figure in having a broad dorsal band along the abdomen; the thorax being white; while, in the figure quoted above, it is represented as being yellowish. It also differs in the costa of the fore wings being darker at base; by having a large blackish spot on the outer third of the costa; and by the broad, continuous, median longitudinal band reaching the outer edge (it being broken up in Schæffer's figure.) There is a row of dots along the inner edge of the fore wings, which is not represented in the figure; the hind wings are also darker.

The female agrees well with Herrich-Schæffer's figure. From Pebas.

Crino bellatrix (Cramer) Walker, B. M. Cat. Pebas. Cramer's specimens were from Surinam, and Walker's from Ega.

Letis xylia Guenée? Two specimens from Pebas are identical with a specimen from Para, Brazil, in the Museum of the Academy. The specimens agree better with Guenée's too brief description than any other species described by him. His specimens came from Mexico. Our moths differ in having the angle of the outer line (*coudée*) distinct, and the wings show scarcely any bronze reflections, though the veins throw off slight violaceous reflections. The lines on the under side of the wings instead of being violet-black, are dull brown-black. The species, which seems to be common and widely distributed, may prove to be undescribed.

Besides these few lepidoptera were numerous specimens of both sexes and workers of a species of ant, *Œcodoma*, allied to *Œ. insularis* of Guerin; and the following Coleoptera, named by Mr. G. D. Smith of Boston: *Cœlosis Nicon* Chev., *Podischnus Agenor* Burm., *Pyrodes speciosus* Fabr., *Mallodon spinibarbe* Linn., *Cratosomus dumosus* Sch., *Eutimus granulatus* Linn., *Rhyncophorus palmarum* Linn., and *Doryphora suturalis* Fabr. There were also several specimens of both sexes of *Thore beata* McLachlan, a beautiful Agrion-like insect (kindly identified by Dr. Hagen), and a species of Proscopia, an orthopterous insect. There were also three genera of spiders represented; an *Epeira*, a *Lycosa*, and a *Mygale*.

List of the Crustacea collected by J. A. McNiel in Central America. By Sidney I. Smith.

BRACHYURA.

Maioidea.

Leptopodia debilis, sp. nov. Male. Carapax naked, or minutely pubescent, and smooth; the branchial regions swollen. Rostrum about twice as long as the posterior portion of the carapax, slender, cylindrical, armed with a row of spines on each side, and sparsely hairy toward the extremity. A strong spine on the basal segment of the antenna and a similar spine on each side just behind the orbit. Chelipeds equal, slender, reaching nearly to the distal extremity of the carpus of the first ambulatory legs; ischium with a few small spines on the inner side; merus not quite as long as the hand, cylindrical, armed with several spines along the sides, and with three stout ones on the inner side at the articulation of the carpus; carpus with two or three small spines on the outer side, and two at the distal extremity on the inner side; basal portion of the hand cylindrical and smooth, but thickly covered with a minute pubescence; fingers nearly as long as the basal portion of the hand, sparsely hairy, slender, nearly straight horizontally but curved inward laterally at the tips, slightly channelled longitudinally, the prehensile edges approximate, toothed toward the base, and serrate toward the extremity, the serrations of the dactylus fitting accurately those of the propodus. Ambulatory legs slender, cylindrical, and slightly pubescent; meral segments armed with scattered spines, most of which are on the distal two-thirds of the length; carpi with two or three spines about the middle, and four at the distal extremity; propodi armed with small, scattered spines and spinules; dactyli beset with numerous spinules. First segment of the abdomen nearly as long as broad; second broader and very short; third broadest of all the segments, the lateral margins projecting into angles next the second segment and rapidly converging toward the fourth, which narrows very rapidly to the fifth; fifth segment twice as broad as long, the lateral margins at first converging rapidly and then only slightly as they approach the sixth; terminal article, which is composed of the sixth and seventh segments completely anchylosed, about twice as long as broad, the extremity angular but with the point rounded. Length of carapax, including rostrum, 29.5^{mm}; length of rostrum from tip to the posterior side of orbit, 19.0; breadth of carapax, 9.9. Length of cheliped, 34.0; hand, 14.8; dactylus, 7.0. Length of first ambulatory legs, 72.4—74.2; second, 71.3—74.2; third, 58.0; fourth, 50.5. A single specimen from the Bay of Realejo.

There are specimens of this species in the Museum of Yale College, collected at Panama and the Pearl Islands, by Prof. F. H. Bradley, and among these, are females which agree pretty well with the figure of Edwards' and Lucas' *L. sagittaria* from Valparaiso. *L. debilis*, however, differs from the figures of the typical Atlantic *sagittaria* in the much shorter chelipeds with proportionately much longer fingers, and in the form of the male abdomen, which is very different from the figure of the Atlantic *L. sagittaria* given by Edwards in the Règne animal de Cuvier, and quite like the figure of the Valparaiso species given by Edwards and Lucas.

CANCROIDEA.

Panopeus validus Smith, Proc. Boston Soc. Nat. Hist., vol. xii, p. 278, 1869. A single specimen collected in the Gulf of Fonseca.

Panopeus transversus Stimp., Annals Lyc. Nat. Hist., N. Y., vol. vii, p. 210, 1860. One specimen from Corinto, west coast of Nicaragua.

Ozius integer, sp. nov. Male. Carapax broad, strongly convex in front but flattened in the middle and posteriorly; anterior portion of the mesogastric lobe narrow and bordered by deep sulci which fade out before they reach the middle of the carapax; anterior portions of the cervical sulci longitudinal, nearly parallel to the median sulci, and fading out at the same distance from the front; mesobranchial lobe indistinctly circumscribed. Surface of the anterior portion of the carapax, and along the margins even back of the lateral angles, rugose and filled with deep pits as if eroded; median and posterior regions smooth or minutely granulous. Front deflexed and transversely channelled, nearly straight as seen from above, but, in a front view, deeply undulated, with two median teeth, or lobes, which are prominent, but obtusely rounded. Antero-lateral border with a continuous, slightly upturned margin, not toothed or lobed, but with slightly marked elevations in the margin in place of the posterior teeth. Postero-lateral border rounded and with a very slight tooth just back of the lateral angle. Infero-lateral regions naked and granulous. External maxillipeds nearly naked, the meral segments granulous and longitudinally bisulcate. Chelipeds unequal; meral segments short, not projecting beyond the carapax; carpal segments unarmed, outer surface evenly rounded, but somewhat roughened as if eroded; hands rounded, the upper and outer surfaces roughened like the carpi, but in a much greater degree; fingers of the larger hand widely gaping, nearly cylindrical, with a few, low, obtuse teeth within; fingers of the smaller hand slightly channelled longitudinally and their prehensile edges closely approximating. Ambulatory legs slightly granulous and naked, except the propodi, which are a little pubescent toward the distal extremities, and the dactyli, which are stout, cylindrical, and completely covered, except the horny tips, with a short and very dense pubescence. The abdomen is broadest at the third segment, which projects in an angle on each side between the bases of the third and fourth ambulatory legs; from the third segment, it tapers regularly to the middle of the sixth, which is nearly as long as broad, with the lateral edges concave; the terminal segment is broader than long and has the extremity rounded. Length of carapax, 15.0^{mm}; breadth of carapax, 23.5; ratio of length to breadth; 1 : 1.57.

A specimen collected at Aspinwall.

Eriphia squamata Stimp., Annals Lyc. Nat. Hist., N. Y., vol. vii, p. 56, 1859, and p. 217, 1860. Collected at Corinto, Nicaragua.

Arenæus bidens, sp. nov. Male. Carapax granulous and naked above, except between the teeth of the antero-lateral margin and along the postero-lateral margin, where it is pubescent; gastric region and the posterior part of the branchial, more convex than in *A. cribrarius*. Front with two prominent, slender, obtuse, median teeth separated from each other by a deep and narrow sinus, and from the inner angles of the orbits, by broad rounded sinuses. Orbit broken above by two fissures, which are deeper than in *A. cribrarius*, and the truncated tooth between them more slender. Teeth of the antero-lateral border long and subcylindrical, the anterior ones obtuse, and the posterior ones acutely pointed; the one next the lateral spine hooked forward at the tip, and longer than the one in front of it; the lateral spine slender, nearly straight, and almost or quite as long as the space occupied by the four teeth in front of it. Infero-lateral regions clothed with a long and dense pubescence. External maxillipeds, chelipeds, and ambulatory legs very much as in *A. cribrarius*; the hands, however, are a little stouter, the teeth on the prehensile edges of the fingers more slender and acute, and the spine on the outside of the carpus is almost obsolete. Sternum flat posteriorly, and the whole surface naked, minutely granulous, and sparsely punctate. Terminal segment of the abdomen long and narrow, being twice as long as broad, the extremity slender and acute. First pair of abdominal appendages slender, reaching to the tip of the abdomen, curving inward near the base, then gently outward to beyond the middle, and then inward again to near the very slender tips, which are straight.

The female differs very little from the male, but is somewhat thicker and more convex, and the abdomen is broadly triangular as in *A. cribrarius*.

In coloration, alcoholic specimens resemble *A. cribrarius*, but the reticulations seem to be finer and more irregular.

Several specimens give the following measurements: —

Sex.	Length of Carapax including frontal teeth.	Breadth of Carapax including lateral spines.	Ratio of length to breadth.	Length of lateral spine.
	mm.	mm.	mm.	mm.
Male	24.4	60.0	1: 2.09	9.8
Male	19.3	48.0	1: 2.48	7.0
Male	15.9	41.4	1: 2.60	
Female	15.3	38.3	1: 2.50	

Collected at Corinto, Nicaragua, in June and July, 1868.

A. cribrarius of the east coast, heretofore the only known species of the genus, is at once distinguished from this species by the quadridentate front, the much broader and stouter teeth of the antero-lateral border, and by the much more slender terminal segment of the male abdomen.

Callinectes, sp. A single young specimen of *Callinectes* collected in the Gulf of Fonseca, agrees very well with Ordway's description of *C. arcuatus*, Boston Journal Nat. Hist., vol. vii, p. 578, 1863, except there is only one distinct spine on the carpus of the chelipeds, the inner ones being nearly obsolete. It may be an undescribed species, but the specimen is too young for accurate determination.

OCYPODOIDEA.

Ocypoda Gaudichaudii Edwards and Lucas, Voy. de d'Orbigny dans l'Amér. mérid., Crust., p. 26, pl. 11, fig. 4, 1843. Collected in the Gulf of Fonseca.

Gelasimus heterophthalmus Smith, Trans. Conn. Acad., vol. ii, p. 116, pl. 2, fig. 6, pl. 3, fig. 1, 1870. Gulf of Fonseca.

Gelasimus heteropleurus Smith, loc. cit., p. 118, pl. 2, fig. 7, pl. 3, fig. 2. Gulf of Fonseca.

Gelasimus princeps Smith, loc. cit., p. 120, pl. 2, fig. 10, pl. 3, fig. 3. Corinto, Nicaragua.

Gelasimus armatus Smith, loc. cit., p. 123, pl. 2, fig. 5, pl. 3, fig. 4. Gulf of Fonseca.

Gelasimus ornatus Smith, loc. cit., p. 125, pl. 2, fig. 9, pl. 3, fig. 5. The locality from which this species came is uncertain.

Gelasimus gibbosus Smith, loc. cit., p. 140, pl. 2, fig. 11, pl. 4, fig. 8. Gulf of Fonseca.

Gecarcinus quadratus Sauss., Revue et Magazine de Zool., 2e. sér., tome v, 1853, p. 360, pl. 12, fig. 2; Stimp., Ann. Lyc. Nat. Hist., N. Y., vol. vii, p. 233, 1860. Collected at Corinto, Nicaragua.

Cardiosoma crassum Smith, Trans. Conn. Acad., vol. ii, p. 144, pl. 5, fig. 5, 1870. Gulf of Fonseca.

(*?*) *Goniopsis cruentatus* DeHaan. There are two specimens of *Goniopsis* from the Gulf of Fonseca, which are apparently identical with the Atlantic species, but I have had no opportunity for a careful comparison of males from the two coasts, and therefore do not feel quite certain of the identity of the west coast specimens.

Pachygrapsus transversus Gibbes, Proc. Amer. Assoc. Adv. Sci., 3d meeting, 1850, p. 181; Stimp., Ann. Lyc. Nat. Hist., N. Y., vol. vii, p. 64, 1859. One specimen from the Gulf of Fonseca, which I am unable to distinguish from specimens from the east coast. There are specimens of the same species in the Museum of Yale College, collected at

Panama, and several other points on the Pacific coast, by Prof. F. H. Bradley.

Sesarma sulcata Smith, Trans. Conn. Acad., vol. ii, p. 156. Corinto, Nicaragua.

(?) *Aratus Pisoni* Edwards, Ann. des Sci. nat., 3me sér., 1853, tome xx, p. 187; *Sesarma Pisoni* Edw., Hist. nat. des Crust., tome ii, p. 76, pl. 19, figs. 4, 5. A specimen from Corinto, Nicaragua, appears to belong to this species, but it has not been carefully compared with east coast specimens.

LEUCOSOIDEA.

Leucosilia Jurinii Bell, Trans. Linn. Soc., vol. xxi, p. 295, pl. 32, fig. 1, 1855. Corinto and Bay of Realejo.

ANOMOURA.

DROMIDEA.

Hypoconcha Panamensis Smith, Amer. Naturalist, vol. iii, p. 249, 1869. A large specimen from the Bay of Realejo.

PORCELLANIDEA.

Ptrolisthes armatus Stimp., Ann. Lyc. Nat. Hist., N. Y., vol. vii, p. 73, 1859. Gulf of Fonseca.

PAGURIDEA.

Clibanarius Panamensis Stimp., Ann. Lyc. Nat. Hist., N. Y., vol. vii, p. 84, 1859. Gulf of Fonseca.

MACROURA.

THALASSINIDEA.

Gebia spinigera, sp. nov. Female. Median tooth of the rostrum broad, triangular; lateral teeth, slender, spiniform, separated from the median by deep sulci, which extend back nearly to the cervical suture and leave, along the sides, sharp, narrow ridges armed with a single line of spinules; dorsal surface of the rostrum, two-thirds of the way to the cervical suture, except a short median sulcus near the tip, armed with sharp spines, which decrease in size posteriorly and of which two at the tip are somewhat larger than the rest, and all give rise to numerous short hairs. A slender spine on the anterior border opposite the eye and just below the lateral spine of the rostrum; cervical suture marked by a deep sulcus which is bordered posteriorly, along the side of the carapax, by a slight ridge armed with two or three short spines on the hepatic region; cardiac and branchial regions smooth and naked. Chelipeds equal; ischium and merus smooth and naked, except a line of hairs along the lower edge; a single slender spine on the lower side of the ischium, and, on the merus, several very small ones in the same position, and a large acute one on the upper side a little way from the distal extremity; carpus short, a slight longitudinal sulcus on the outer surface, inner margin denticulate and pubescent, with a small proximal and a large distal spine, both directed forward, spines on the distal extremity at the outer and inferior angles, and another on the inner side; basal portion of the propodus stout, subcylindrical, with longitudinal lines of granules on the upper side, which give rise to hairs, and a slightly oblique, narrow line of dense pubescence along the lower side; propodus but little shorter than the dactylus, nearly straight, tapering to a slender point, smooth, naked, and the prehensile edge armed, near the base, with two or three, small, obtuse teeth; dactylus clothed with long lines of pubescence and the prehensile edge armed with an obtuse tooth near the base, and, near the tip, with a large slender one which shuts just by the tip of the propodus; beyond this tooth the extremity extends in a conical, horny tip about as long as the tooth. Second thoracic legs ciliated along the inferior edge of the meri, and along both edges of the propodi and dactyli; merus compressed and armed with a slender proximal spine on the inferior edge and a similar distal one on the upper edge; carpus unarmed, but slightly ciliated within; propodus broad and compressed; dactylus short, triangular. Third thoracic legs with a small spine above the genital orifice, a slight one on the inferior edge of the ischium, and several on the inferior edge of the merus; dactylus, propodus, and distal portion of the carpus ciliated on the outer side and the inner edges; dactylus narrow and about as long as the propodus. Fourth thoracic legs armed with a row of spines along the inferior edge of the merus; the three last segments much as in the third pair of legs. Fifth thoracic legs slender, subcylindrical; propodus thickly ciliated on the anterior side; dactylus slender and very short. Abdomen ciliated along the edges of the third, fourth, and fifth segments, but smooth and naked, above. Appendages of the sixth segment with a spine above at the articulation of each lamella; lamellæ smooth and carinated above, the extremity of the outer one slightly arcuate, that of the inner truncate, but slightly rounded at the inner angle. Terminal segment quadrilateral, broader than long, the dorsal surface smooth and naked, with slight lateral carinations and a median sulcus. Length of a specimen, from tip of rostrum to extremity of abdomen $4.10^{mm.}$ Length of carapax along the dorsal surface, 13.0. Length of hand, 9.5.

A large number of specimens, all females, collected at the Island of Aseredoras, twenty miles northwest of Corinto, Nicaragua, March 14th, and a few from the Gulf of Fonseca, May, 1869.

CARIDEA.

Atya rivalis, sp. nov. Male. Carapax compressed, naked, and entirely smooth, except the gastric region which is punctate with shallow puncta. Rostrum short, median carina sharp, high, extending to the acutely triangular tip and separated from the lateral carinæ by deep sulci; lateral teeth right-angled, but not acute. Peduncle of the antennula armed above with small spines; inner flagellum shorter than the carapax, but much longer than the outer. Antennal scale considerably longer than the peduncle, narrow, ovate at the tip, the outer margin straight and armed with a very slender spine; flagellum longer than the carapax. Legs of the first and second pairs equal in size, smooth and naked, except the tips of the fingers; meral segments compressed and longitudinally sulcate. Legs of the third pair much stouter than the others and the meral, carpal, and propodal segments thickly beset with small squamiform tubercles; propodus a little longer than the carpus; dactylus short, unguiform, the basal portion slightly thickened and armed beneath with several minute spines. Legs of the fourth pair much more slender and not so strongly tuberculate, but the carpus armed with one, and the merus with two or three spines beneath. Legs of the fifth pair still more slender, the propodus proportionately longer, and the merus and carpus spined beneath as in the fourth pair. Abdomen smooth and naked; lateral margins of the second, third, fourth, and fifth segments truncate. Lamellæ of the appendages of the sixth segment evenly rounded at their extremities and projecting only slightly beyond the terminal segment. Terminal segment narrow, the sides straight and converging regularly to the truncate extremity, which is ciliated and armed with minute spines; dorsal surface with a slight median sulcus with lines of small aculei each side. Length from tip of rostrum to extremity of abdomen, 40.6^{mm}. Length of carapax, from orbit to middle of posterior margin, 13.2; from tip of rostrum to middle of posterior margin, 15.6; breadth of carapax, 6.8; height of carapax, 8.4. Third thoracic legs, entire length, 27.5; merus 9.0; carpus, 3.6; propodus, 3.4; dactylus, 1.3.

Fresh water streams, Polvon, Occidental Department, Nicaragua. Six specimens.

Atya tenella, sp. nov. Male. Carapax compressed, narrowed in front, entirely naked, and smooth, or slightly punctate on the gastric region. Rostrum longer than in the last species; terminal portion acute, somewhat deflexed, and with a sharp carina both above and below; lateral teeth obtusely rounded. Peduncle of the antennula unarmed, except a few weak, bristle-like spines at the articulation just in front of the eye; inner flagellum about as long as the carapax, outer much shorter. Antennal scale regularly ovate at tip; flagellum much longer than the carapax. Legs of the first and second pair very much as in the last species. Remaining thoracic legs slender, decreasing successively in size posteriorly, those of the third pair not very much stouter than those of the fourth; all nearly naked and very slightly spinulose, the meral and carpal segments in the fourth and fifth pair armed beneath as in *A. rivalis*, and the dactyli as in that species. Abdomen similar to that of *A. rivalis*, but the lamellæ of the appendages of the sixth segment are rather longer in proportion, and the terminal segment is rounded instead of truncate at the extremity. Length from tip of rostrum to extremity of abdomen, 62.0$^{mm.}$ Length of carapax, from orbit to middle of posterior border, 18.2; length, including rostrum, 22.8; breadth of carapax, 11.8; height of carapax, 14.8.

Six specimens from the same locality as the last species.

Evatya, gen. nov. Allied to *Atya*, but the body stout, not compressed; rostrum prominent, carinate, and armed above with stout spines; anterior portions of the carapax with numerous scattered spines and spiny carinations; a spine on each side above the eye and three on the anterior border at the base of the antenna. Thoracic legs of the third pair very stout and tuberculate; the basis completely anchylosed with the coxa, and the ischium so firmly united to the merus as to admit of no motion between them; the propodus very much shorter than the carpus; the dactylus short, unguiform, and so closely united with the propodus as to admit of no motion, or only the very slightest, at the articulation with it.

Evatya crassa, sp. nov. Male and Female. Carapax stout, about as broad as high, and with broad emarginations in the lateral margins above the bases of the legs of the third pair. Rostrum as long as the antennal scale, slightly curved downward, broad at base, and tapering to an acute point; a broad carina above armed with six to eight stout spines, about half of which are on the carapax back of the base of the rostrum. Anterior half of the median portion of the carapax armed with small spines which decrease in size posteriorly; two vertical spines on each side at the base of the rostrum, the anterior one, just over the eye, very large and stout, the other smaller and directly behind the first; a stout antennal spine directed upward, and, just below it, two smaller spines in the margin; from the antennal spine, a carina, somewhat broken in the middle and armed with a single line of small spines, extends backward nearly to the cervical suture; just above this, but more posteriorly, is a smaller broken line of spines, which is connected with the spines on each side of the base of the rostrum by a little group of several spines somewhat isolated from the rest; posterior and lateral portions of the carapax coarsely punctate and unarmed. Peduncle of the antennula armed above with small spines; inner flagellum stout, nearly as long as the carapax; outer flagellum much less stout and not more than half as long as the inner. Peduncle of the antenna smooth and unarmed; antennal scale reaching a little beyond the peduncle, the outer margin thickened, concave in outline, and armed with a very strong spine; flagellum very stout and nearly twice as long as the carapax. Legs of the first and second pairs about equal in size and very similar to those of the the species of *Atya* just described, but all the segments more or less hairy. Legs of the third pair greatly developed, even in the very young, the two when placed together, side by side, being thicker than the carapax; basis and ischium tuberculose and hairy beneath; merus long and very stout, rounded without and flattened on the inner side, the whole outer surface thickly beset with prominent, squamiform tubercles, which show a tendency to an arrangement in longitudinal lines, most of the tubercles giving rise at their bases to little tufts of pubescence, the flattened inner surface unarmed, but densely hairy along the lower edge; carpus nearly as broad as long, the upper surface tuberculose like the merus, but the tubercles rather larger and more crowded together, the inner and under surface densely hairy; propodus very short, being broader than long, the outer surface with close set, large tubercles like those on the distal end of the propodus, the inner and under surface densely hairy; dactylus forming a stout, cylindrical, horny claw, longer than the propodus, and curved strongly downward. Legs of the fourth pair very much more slender, not reaching, by considerable, the distal extremity of the merus of the third pair, hairy along the inner side, and thickly beset with small squamiform tubercles, which increase in prominence distally and become slender spines at the extremity of the propodus; propodus cylindrical and longer than the carpus; dactylus small, composed of a thickened basal portion and a slender terminal claw, and unarmed except a few minute spines on the under side of the basal portion. Legs of the fifth pair like those of the fourth, but smaller, and the propodi proportionately longer. Dorsal surface of the abdomen evenly convex, naked, and closely punctate; first and second segments with a strong lateral, submarginal carina, which is specially prominent on the lateral expansions of the second; third to sixth segment with the posterior lateral angles produced into conical points or spines. Appendages of the sixth segment with a stout spine above the articulation of each lamella; lamellæ very broad and slightly pubescent above. Terminal segment, at base, nearly as broad as long, and tapering rapidly to a truncate and spined extremity; upper surface with a median sulcus toward the extremity, armed, on either side, with a line of four or five aculei. Length of a male from tip of rostrum to extremity of abdomen, 141mm. Length of carapax from orbit to middle of posterior border, 60.8; height of carapax, 29.5. Length of rostrum, 16.4. Third thoracic legs, entire length, about 80; merus, 42; carpus, 20; propodus, 7; dactylus, 10.

Young, less than 30 mm. in length. do not differ from the large specimens, except in having the third pair of thoracic legs a very little less robust, and the spines of the carapax, etc., slightly less developed.

Fresh water streams, Polvon, and the "Rio Fulva, two and a half miles northwest of Realejo;" both localities in the Occidental Department of Nicaragua.

Leander gracilis, sp. nov. Female. Rostrum very long, strongly curved upward in the middle of its course, and the terminal portion very slender; the upper edge armed with eight or nine teeth, of which six or seven are on the basal half and the others near the tip, and the under edge with nine or ten small teeth, which decrease in size anteriorly and become very minute near the tip. Outer flagellum of the antennula slender and much longer than the entire body; inner flagellum only slightly shorter. Flagellum of the antenna slender and fully twice as long as the rest of the animal. First thoracic legs reaching nearly or quite to the tips of the antennal scales, very slender, and naked, except a few hairs on the fingers. Legs of the second pair reaching to the tip of the rostrum, very slender and nearly naked; hand, about three-fifths as long as the carpus, cylindrical, very slender and delicate, the fingers nearly as long as the palmary portion. Abdomen rounded and smooth above, the lateral portions of the first three segments with shallow vertical sulci, sixth segment compressed laterally and about twice as long as the fifth. Lamellæ of the sixth segment very narrow, the extremities ovate, the inner ones extending slightly beyond the tip of the abdomen, the outer ones much longer. Terminal segment narrow and tapering regularly to a very slender and acute point. A specimen with eggs beneath the abdomen gives the following measurements: Length of body from tip of rostrum to extremity of abdomen, 43.2mm. Length of carapax from orbit to middle of posterior margin, 7.5; length of rostrum from tip to base of eyes, 11.7; length of basal scale of antenna, 7.9; length of first thoracic legs, 12.6; length of second thoracic legs, 17.0; merus, 3.5; carpus, 5.6; hand, 3.3; dactylus, 1.5.

"Estero at Realejo," west coast of Nicaragua.

Palæmon Jamaicensis Olivier, Edwards, Hist. nat. des Crust., tome ii, p. 398; Martens, Wiegm. Archiv xxxv, 1869, p. 22. A large number of specimens from Polvon, Occidental Department of Nicaragua, agree with the descriptions of this species and with a Brazilian specimen. In several of the very large specimens the legs of the second thoracic pair are somewhat unequal, but in all of them the fingers are nearly as long as the palmary portion of the hand, thus differing from the *P. brachydactylus* of Wiegmann.

Palæmon tenellus, sp. nov. Male. Rostrum very long, reaching far in advance of the tips of the antennal scales, the basal half high, curved somewhat downward, then beyond the middle curved strongly upward, and tapering to a slender extremity; the upper edge armed with eight to ten teeth, of which seven or eight are on the basal half and the others near the tip, and the under edge with six or seven teeth. Second thoracic legs slender and nearly smooth, except the fingers, which are straight, slender, somewhat hairy, and not quite as long as the palmary portion of the hand. Fifth segment of the abdomen projecting into a sharp point at the posterior lateral angle. Sixth segment less than a third longer than broad; the lamellæ rather narrow and evenly rounded at the extremities. Terminal segment narrow and tapering to a triangular tip armed with small spines. Length of body from tip of rostrum to extremity of abdomen, 96^{mm}; length of carapax from orbit to middle of posterior margin, 23.1; length of rostrum, 23.9. Another specimen gives: Length of body, 83^{mm}; carapax, 18.7; rostrum, 20.0; second thoracic legs, 41.0; merus in second thoracic legs, 9.1; carpus, 12.1; hand, 10.5; dactylus, 4.8.

Polvon, Occidental Department of Nicaragua.

Both of the second thoracic legs are preserved in no one of the specimens, and those which are present seem very small and may have been reproduced. This species is very much like *P. Amazonicus* Heller, Sitzungsberichte der kaiser. Akad. der Wissenschaften, Wien, xlv, p. 418, pl. 2, fig. 45, 1862 (which is the same as *P. ensiculus* Smith, Trans. Conn. Acad., vol. ii, p. 26, pl. 1, fig. 2, 1869), but is at once distinguished from it by the terminal segment of the abdomen, which has a triangular and spinous tip, instead of terminating in a very slender and acute point; the sixth segment also is not nearly so narrow, and its lamellæ are not so long and slender.

LIST OF ADDITIONS TO THE MUSEUM DURING THE YEARS 1869 AND 1870.

AARON, JOHN. Wasps' Nest from House, Salem.

ABBOTT, CHARLES C., Trenton, N. J. Specimens of Hybognathus osmerinus (Cope). Bryttus chætodon and B. obesus from New Jersey.

A FRIEND, Bark "Florence." Embryo of Porpoise and a young Flying Fish, taken on the passage from New York to Zanzibar.

A FRIEND, Wakefield. Stone Arrowheads from Wakefield.

AGGER, Miss KITTY, Salem. Peacock Moth from Salem.

ALCOTT, W. P. Anthus sp. from Connecticut.

ALMON, ANDREW B., Salem. Four Steel Spurs used by the Malays for arming fighting cocks.

AMES, JAMES T., Chicopee, Mass. Specimens of the rocks associated with the emery found at Chester, Mass.

ANDREWS, I. WATSON, Salem. Longicorn Beetles from vicinity of Salem.

ANDREWS, JOHN L., Melrose. A small slab containing Fossils from West Mountain, Scoharie, N. Y., and a specimen of Arragonite from Howe's Cave.

ANGUS, JAMES, West Farms, N. Y. A large number of Insects from West Farms.

ARNOLD, JOHNSON. Insects from Wenham.

ASHBY, HERBERT, Salem. Redwinged Black Bird from vicinity of Salem.

ATKINS, CHARLES G., Augusta, Me. Living specimens of young Salmon, and Eggs of Salmo fontinalis from Grand River, Maine.

BALCH, D. M., Salem. Mollusca from Florida.

BALL, Mrs. MARY F., San Francisco, Cal. An ancient adobe brick forming a part of the wall of a vault 17 feet under ground, near San Francisco; the brick bearing on the end what are considered Chinese characters.

BARTLETT, JOHN (Executors of), Haverhill. A large collection of Shells and Fossils from various localities. The Shells are mostly from the Western States.

BATTIS, JOHN M., Salem. Specimen of Anomia from bottom of brig Morning Star, at the Sandwich Islands.

BEALS, ALBERT C., U. S. A., Fort Macon, N. C. Crustacea and Worms from Fort Macon, N. C.

BEASER, DANIEL, Ontonagon, Lake Superior. 54 Specimens of Minerals and ores from Lake Superior.

BEHRENS, JAMES. Collection of California Insects.

BEMIS, Miss CAROLINE. Skin of Florida Jay. Reptiles, Insects, Crustaceans, Radiates, and Mollusks, alcoholic and dry; also portion of an Indian skeleton, all from St. Augustine, Fla.

BEMIS, LUKE. Eleven specimens of Mica containing Magnetic Iron, from New Castle Co., Pa,, and one Attacus sp. from Glenn Mills, Pa.

BERRY, RICHARD, Newbern, N. C. Silk Spider from Newbern.

BERRY, E. Epeira from Newbern, N. C.

BICKNELL, E., Salem. Garnets from Ragged Island, Casco Bay, and Ascarias from a pig.

BIXBEE, Mrs., Bradford. Attacus Luna from Bradford.

BOLLES, F. D., Boston Highlands. Four Birds from vicinity of Boston.

BRADLEY, Prof. F. H. Fossils from the Clinton Group from Indiana.

BROOKHOUSE, R., Salem. Specimen of Albino Swallow killed at Rowley.

BROOKHOUSE, R., Jr, Salem. Fossil Wood, etc. Hair of Antelope and Specimens of Grass from Colorado.

BRIGHAM, T. S., Salem. Two Snow Buntings, and two Lesser Redpoll Linnets shot in Salem.

BROMLEY, H. H., Birmingham, N. Y. Stone Arrowhead found near the Au Sable Falls, N. Y.

BROWN, A. D. A Beetle and several Hemiptera from Croton Oil Plant from Rio de Janeiro.

BROWNE, A. S., Salem. Oxide of Iron from Katahdin Iron Works, Maine.

BROWN, Mrs. WILLIAM, Salem. East Indian Shells.

BRYANT, Mrs. HENRY, through Smithsonian Institution and Boston Society of Natural History, a collection of Brazilian and West Indian Bird Skins from the collection of the late Dr. HENRY BRYANT.

BUNKER, R. Insects from New York.

BURBANK, L. T., Lowell. Four Stone Arrowheads from Lowell.

BURNHAM, WILLIS G., Essex, Mass. A beautifully made Stone Axe from Essex, a piece of Trap Rock from Marblehead, and Ochreous Earth from Essex.

BUTLER, Gen. B. F. Clay from the Artesian Well at Fort Monroe, taken at the depth of 731 feet; also a plan of the well showing the various strata through which it has passed.

BUTLER, FRANK. Lump Fish, Pecten and Bryozoa, from the Grand Banks; Eggs of Sea Fowl and Vertebræ of Shark.

BUTTERFIELD, W. W., Indianapolis, Ind. Ferns from Indianapolis.

BUTTRICK, S. B. Cicada rimosa and Bittacomorpha clavipes from Salem.

BY PURCHASE. A specimen of Ling from Lake Winnipiseogee, taken at Alton Bay, and a young Crocodile from Madagascar.

CABOT, J. ELLIOT, West Beach. Petromyzon sp., taken clinging to a Mackerel off West Beach.

CALLEY, BENJ., Marblehead. A Rock brought up from Grand Banks, having a fine growth of Bryozoa, etc., on it.

CARR, ANDREW, Salem. Living Red Tailed Hawk, caught in Salem.

CARLEN, S., Salem. Carcass of a Cat thirteen years old; Black Snake.

CASE, L. B. Cases of Helicopsyche from Richmond, Ind.

CATON, J. D., Ottawa, Ill. Striped Snake (young) from the Geysers of California.

CHADWICK, JOHN. Vertebra of a Fossil Shark from Charleston, S. C.

CHAMBERLAIN, Mrs. J. Nest of a Vireo from the vicinity of Salem.

CHAMBERS, V. T. Chalcis from Telea Polyphemus from New Orleans.

CHANDLER, J. P., Salem. A curious growth of Fungus from Colebrook, N. H.

CHASE, GEORGE. Wild Oats from Mountain View, Santa Clara Co., California.

CHEEVER, E. E. Fossil wood from the locality known as the "Petrified Trees," near Colorado.

CLARK, DANIEL, Flint, Mich. Living specimen of Tryonyx ferox from Lake Michigan.

CLARK, WESLEY, Panama. Crustacea taken in fifteen fathoms of water, at Pearl Island, Bay of Panama.

CLEMENT, S. Centipede from Cuba.

CLEVELAND, H. R., Salem. Skulls of Alligator and Cavia, portions of the under jaw of a Mastodon, Skin of a Toucan, Insects and various seeds, all from near Honda on the Magdalena River, U. S. C.

CLEVELAND, WM., Ithaca, N. Y. Lingulæ and Insects from Ithaca, N. Y.

CLOUTMAN, STEPHEN, Salem. Snake from Madagascar, Echineus sp. from Atlantic Ocean, and a Millipede from Zanzibar.

CLOUTMAN, WM. R., Charleston, S. C. Postpliocene Fossils from near Charleston.

COCHRANE, JOHN L., Peabody. Red Shouldered Hawk from Peabody.

COLCORD, Mrs., Peabody. Nest and Eggs of Peewee and two specimens of Coleoptera, also galls of various Insects; Indian Implements dug up in a field at Peabody (from several feet below the surface); Triton violacea; 2 Living specimens of Limacodes sp. found feeding on a Pear Tree; all from Peabody, Mass.

CONRAD, JACOB and BERNARD. Young Civet Cat from West Indies.

COOKE, C., Salem. Three specimens of Icteridæ and two specimens of Java Sparrow, male and female. Insects from Zanzibar, E. C. A.

COOK, J. P., Salem. Lead from Mines at Sandwich, N. H.

COOK, WM. S., Salem. Minerals from Mt. Washington.

COOPER, Dr. J. G., San Francisco. Pterophorus and Chironomus from San Francisco, Cal.

COUES, Dr. ELLIOT, U. S. A. Parasites from various mammals from North Carolina.

CRANE, S. O., Salem. Common Brown Bat from Middleton, Mass.

CRANSTON, A., U. S. A., Ft. Macon, N. C. Crustacea and Worms from Fort Macon.

CURRIER, Mrs. SUSAN, Birmingham, N. Y. A Black flint arrowhead, found near the Au Sable Falls, N. Y.

CURTIS, JOSIAH. Fifteen specimens of Shells from the shell mounds at Knoxville, Tenn.

CURWEN, Mr., Salem. Two Hookah bowls from Calcutta.

DALL, WM. H., Washington, D. C. One Gobioid from an unknown locality; four specimens, three sp. Corals from Japan; one Sertularia from the Island of Isanatsky Pass, Alaska; one Nullipore from Japan; Californian Diptera.

DAVIS, HENRY, McGregor, Iowa. A collection of river and land shells from the Upper Iowa, and a specimen of Clematis from the same locality, also specimens of Leuciscus sp. Two Gopher skins and a collection of Minerals from Money Creek, Minn.

DAVIS, Mrs., Gloucester. A collection of Pressed Algæ from Gloucester.

DANFORTH, S. B., Newburyport. An Albino Woodchuck, taken in Newbury in 1868, and a collection of pebbles from the Eastern Coast of Canada.

DE GERSDORF, Mrs. B. Specimen of Cladonia maculata and Hypnum sp., from Savoy, Switzerland.

DE SHON, J. J., and F. B., Nicaragua. An ancient Rapier bearing the maker's stamp, Lisbon, and the date 1621, found in Nicaragua.

DEVEREUX, G. H., Salem. Cocoon of Telea Polyphemus from a Quince tree.

DORCHESTER, Rev. D., Salem. Horned Frog from Sherman, Texas.

DOUGLASS, A. T., Capt. P. M. S. Co. Living specimen of Coati, female, from Central America.

DOW, JAMES, Beverly Farms. A large Flint pebble dug out of a Gravel pit.

DRAPER, JOHN W., Dorchester, Mass. Fossils from Mammoth Vein Coal Mine, Pennsylvania.

EASTMANN, Dr., Washington, D. C. Larvæ of a wood-boring beetle from a decayed Chestnut stump near Washington.

EATON, HORACE. Specimens of the wood of the Great Trees of California and of the California Red-wood. Rattles from a Snake from California, and a Cup from Aspinwall.

EDWARDS, Prof. A. M., New York. Insects from Salem.

EDWARDS, H. 1,000 specimens Insects from California, Australia and New Zealand; Ticks from Australia, Sitka and California.

EISENSTUCK, Mrs. IDA, Chinandega, Nic. A necklace worn in Chinandega, made by stringing the flowers of the Samara.

EMERY, G. E., Lynn. Two Stone Chisels found at East Andover, N. H. One Chisel, two Gouges, one small Sinker and a very long Stone Pestle from Lynn. An

Indian Idol, or "Medicine," found in an excavation during the grading of the Northern Railroad of New Hampshire, about twenty years ago, in North Boscawen, Merrimack Co., on territory occupied by the Pennacook Indians. Green Jasper and Asbestos from Lynn, Mass. Cicada from Nantucket. A Butterfly with malformed wings, and the vertebræ of a Skate.

EMERTON, J. H., Salem. Insects from Albany, New York, New Hampshire, the White Mountains and Salem.

EMMONS, Capt. G. F., U. S. N., Sloop of War Ossipee. A specimen of Gorgonia from Puntas Arenas, Gulf of Nicoya.

ENDICOTT, —— Salem. Specimen of Eutenia sp.

FARNSWORTH, THOMAS, Salem. Insects from vicinity of Salem.

FELT, JOHN G., Salem. A piece of Apple Tree showing the ravages of Insects.

FISH, W. E., Eastham. Tree Toad from Cape Cod; several collections of Insects from various localities on the Cape; an envelope eaten by Lepisma saccharina; Pupa of Cidaria of the Cranberry from Eastham.

FISHER, CHARLES. Specimen of Gold Ores, Copper Pyrites and Quartz Crystals from California and Nevada. Galena from Galena, Nevada.

FLINT, G. H., Salem. Hyperchiria from Salem.

FOOTE, C., Salem. Cetonia Inda entering a decaying Pear.

FOWLER, S. P., Danvers. A specimen of Hemiramphus sp. from the mill pond at Danversport, collected Oct. 15, 1870. Specimens of Picus pubescens from Danvers.

FREEMAN, TRUEMAN, Salem. Æschna from Salem.

FRIEND, LUKE E., Salem. A fine Black Flint Arrowhead from near the Connecticut River at Thetford, Vt.

GARDNER, Mrs. FRANCIS, Boston. Hemiramphus longirostris from Nantucket.

GARDNER, HENRY, Salem. A specimen of Euplectella speciosa from the Island of Zebu.

GARDNER, WILLIAM, Salem. Young Canary.

GARLICK, Dr. T., Cleveland, Ohio. A pair of Antlers from a Caribou killed about twenty miles north of S. St. Marie, Lake Superior.

GERARD, F. W. Galls of Cynips bicolor, etc., from Newburg, N. C.

GILLMAN, H., Detroit, Mich. A collection of Insects from Lake Superior.

GREENE, E. L. Two specimens of Ophioglossus reticulatus from Albion, Wis., collected Oct. 5, 1866.

GREENE, JAMES L. Six Eggs of Gulls from Brown Cow Island, Casco Bay.

GRIFFEN, Messrs. E. and J., Salem. Monkey from Sierra Leon, W. C. A. Gray Parrot from Africa, and a short Club from the Feejee Islands.

GRIFFEN, H. B., Salem. Egg case containing Embryo of Skate from Rockport.

GROTE, A. R., New York. Insects from Demopolis, Alabama.

GROVER, JAMES, Salem. Dragon Fly from the vicinity of Salem.

GROVER, WILLIAM, Salem. Specimens of Leda thraciæformis, Cardium and Pecten, taken from the stomachs of Flounders from Salem Harbor.

GOLDSMITH, ALONZO. Skin of a young Python; three specimens of Gelasimus sp. from Sierra Leon, Africa; young Flyingfish, and a Parasitic Crustacean from the mouth of the Flyingfish, taken in lat. 22 or 23 N., lon. 40 West.

GOLDSMITH, C. A. Geological specimen.

GOLDSMITH, Capt., Salem. Boltenia sp. from Baker's Island, Salem Harbor.

GOLDTHWAIT, AARON, Salem. Five Kittens born June, 1869, said to be the product of a Dog and Cat.

GOULD, JOHN J., Ipswich. Weasel from that vicinity; 2 Stone Arrowheads and a very small stone Sinker and other Indian implements from Ipswich.

HAGEN, Dr. H., Cambridge, Mass. Apus productus from Konigsberg, Prussia.

Haley, Archibald. Portions of an Indian Skeleton from South Salem.

Hall, Henry D., Capt. U. S. R. M. Specimen of Squilla from Cape Fear River, N. C.

Haratzthy, Col. A., Corinto, Nic. A pair of elaborately carved ancient Stirrups made of wood, from Corinto.

Harran, Miss **Mary K.,** Kingston, R. I. Dænais Erippus from that place.

Harrington, C., Salem. Collection of Native Birds' Eggs.

Harris, Alden, Beverly. An Indian Pestle from Beverly.

Harris, Geo. N., Lt. U. S. A., Fort Macon, N. C. Crustacea and Worms from Fort Macon.

Haskell, J. P., Marblehead. A large collection of Essex County Insects; a specimen of Scomberesox Storerii and several sp. of Boltenia from the Banks; 23 unfinished and broken Arrowheads from Marblehead Neck, ploughed up in a field near the Lowell Camp Ground.

Hauverman, Dr. A. D. Larva of Xyleutes robiniæ from Tuscaloosa, Ala.

Hersey, Geo. D., Westerly, R. I. A specimen of Boleosoma Olmstedii from Pawtucket River.

Higbee, Charles H., Salem. Collection of Turtles from New Jersey.

Hildreth, Fred., and **Clark, Frank,** Salem. Cicada canicularis.

Holland, Frank, Salem. Young Woodchuck from vicinity of Salem.

Holleman, J. Boreus Californicus and other Insects walking or flying on snow from Fort Bidwell, Goose Lake, Cal. Insects from the northern line of California.

Hollenbush, H. W., Reading, Pa. 6 slides of Mounted Diatoms and a large collection of Diatomaceous Earths from various localities.

Holmes, Aaron, San Francisco, Cal. Minerals from Sherman Depot and San Francisco; 2 Tarantula Nests; bark, cones, and seeds, of Sequoia gigantea, and Lichens, from California.

Holmes, J. S., Salem. Insects from Salem.

Hooper, E. L., Boxford. Two Hawks from that place.

Howard, Charles A., Salem. A collection of Reptiles, Insects and Spiders, from near Fort Richardson, Texas.

Howe, J., Methuen. Stone Axe from that place.

Howe, Walter, Lt. U. S. A., Ft. Macon, N. C. Crustacea and Worms from Ft. Macon, N. C.

Howell, Robert, Nichols, Tioga Co., N. Y. A collection of Fossils from the Chemung Group, and a large collection of Indian Implements, broken pottery, etc., from the towns of Nichols and Tioga, New York.

Hutchinson, Capt. **D. H.,** Salem. A Necklace of Human Teeth from the Andaman Islands, and a specimen of Hippocampus from Manila; 1 snake, 69 fishes, 6 Crustaceans from the China Seas, and 21 fishes from Siam.

Hyatt A., Salem. Specimens of an extinct species of reed used in smoking the mummies found in the Mammoth Cave; a collection of Fossils from the vicinity of Annapolis, Md., and a few from the New Red Sandstone, near Greenfield; a collection of Reptiles, Insects, Crustaceans, and Mollusks in alcohol from various localities; a collection of Plants from Anticosti, Norway, Me., and Cambridge, Mass. A collection of Fossils from the vicinity of Annapolis, Md., and a collection of Annelids from Gloucester, Mass.

Johnson, Dr. **A. H.** A small collection of Birds' Eggs from various localities.

Johnson, W. C., Newburyport, Mass. Head of Scymnus brevipinna, specimen of Hemitripterus Acadianus and of Echeneis albicauda, all taken off Newburyport, Mass.

Johnson, Wm. G., Rowley, Mass. Pelvis of Bos domesticus.

Jones, C. S., Salem. Chauliodes pectinicornis from Salem.

Jones, Charles W., Salem. Young Red Shouldered Hawk from North Salem.

Joslyn, Miss Ellen, Sterling, Me. Minerals from Sterling.

Kehew, Fred., Salem. 3 Clubs from the Feejee Islands.

Kendig, Rev. A. B., Davenport, Iowa. A collection of Shells from the vicinity of Davenport.

Killam, S., Salem. Iron Pyrites.

Killam, Sam'l, Boxford, Mass. 3 carcasses of Common Fox; 1 Snipe, 3 Snow Birds, 4 Pine Grosbeaks, and a Great Horned Owl, from Boxford.

Kimball, James, Salem. Shells from Coney Island, New York; Seed vessel of unknown plant from India.

Kimball, Miss Mary B., Salem. A Stone Chisel and 9 pieces of Pottery from a Mound about one mile back of the town of Appalachicola, Fla.; Insects from Appalachicola, Fla.

King, Capt. H. F., Salem. A Cigar Case made by the natives of Java from the quills of Pavo spicifer.

Kinsman, Nathaniel, Salem. A Seal shot at Plum Island, July 25, 1869.

Knight, L. S., Danvers. Insects from that place.

Lake, H. S. Syneda and Plusia from Lake George.

Lander, Miss Louisa, Salem. Cocoon of a Spider, collected Aug., 1869, in Salem.

Lawrence, Charles, Danvers. Unfinished Stone Arrowheads from Danvers.

Leavitt, J. P., Beverly. Meloe angusticollis from vicinity of Salem; Water Jar from Palermo.

Leavitt, Wm., Salem. Humming Bird from Salem.

Le Baron, J. F., Ipswich. Small collection of Plants from Florida, collected in the winter of 1869.

Lee, L. T., U. S. S. Bebb. A large lot of Coral from Florida; 27 specimens of Algæ from Tortugas, Fla.

Lefavour, Lucy Jane, Danversport. Specimen of Gray Squirrel.

Le Grand, Miss, Salem. Diapheromera femoratum from Harmony Grove, Salem.

L. H. P., Portsmouth, N. H. 2 Dried Plants from San Francisco, Cal.

Lockwood, Rev. Samuel, Lockport, N. J. Eggs of Limulus Polyphemus.

Lord, William, Salem. 18 specimens, 3 species of Coral, and 7 species of Land and Marine Gasteropods, from the Sandwich Islands.

Marsh, James, Peabody. 3 Stone Arrowheads; a Twisting Stone, portion of a Gouge and a stone implement all found in Peabody; also a few minerals from California and other localities.

Marsh, Prof. O. C., New Haven. 2 specimens of Aptychus from Solenhofen, Bavaria.

Marshall, Capt., Schooner Rosannah. A piece of Stone, with sponges and Hydroids attached, from George's Bank.

Martin, C., Salem. A pair of Wooden Soled Shoes from England.

Mason, Alonzo, Beverly. Gray Parrot from Africa.

Maynard, C. J., Newtonville, Mass. Fishes and Reptiles from Florida.

McBride, John, Ft. Jefferson. Scorpions from Dry Tortugas, Fla.

McDonald, Philip, Salem. A Portuguese Copper Coin; 2 specimens of Gorgonia from S. America.

McGill, Frank, Salem. 12 specimens of Marine Shells from Zanzibar; 14 specimens of Marine Shells from West Indies; Under Jaw of a Porpoise and a Tooth of a Whale.

Luscomb, J. W., Salem. A pair of Banian Shoes from Calcutta.

Lynch, James, Salem. 2 Musk Deer from Sumatra, and a Leathern Pouch, and Necklace of Charms, said to have been worn by the King of Gambia.

Mack, Miss, Salem. Psocus sp. from Salem.

Mack, Dr. Wm., Salem. Tape Worms.

MANN, Mrs. MARY, Cambridge. Several small collections of Plants from the Herbarium of the late HORACE MANN.

MANNING, ROBERT, Salem. Sandstone marked by Manganese.

MANSFIELD, GEORGE, Salem. Larvæ of Sphinx from Salem.

MANSFIELD, JOHN K., Salem. Malformed Egg of Common Fowl.

MCGRANE, WILLIAM, Salem. Brazilian Copper Coin.

MEADY, D. F., Salem. Model of a Fast Boat from Singapore.

MEINERTH, C., Newburyport. Galls on flowers of Huckleberry from Newburyport, Mass.

MILLER, Dr. G. McL., U. S. A., Ft. Randall. Reptiles and Insects from vicinity of Ft. Reynolds, Colorado.

MOODY, Mrs. SAMUEL, Newburyport. Slab containing Fossils from Mt. Auburn, Cincinnati.

MOORE, Capt., Salem. Eggs of Pyrula sp. from Trent River, N. C.

MOORE, JOSEPH, Richmond, Ind. Golden Crested Wren from that vicinity.

MORRELL, F., Salem. Chicken Snake from vicinity of Salem.

MORSE, Prof. E. S., Salem. Collection of Radiates and Mollusks from Eastport, Me.; 7 species Mollusks from Moosehead Lake; Crustaceans and Worms from Ft. Macon, N. C., and a specimen of Camphor wood.

MUDGETT, S. A., Salem. Fossil Cast of Venus sp.

MUSEUM OF BOWDOIN COLLEGE. Asteracanthion polaris from Labrador.

MUSEUM OF COMPARATIVE ZOOLOGY, Cambridge. 2 species Mollusca from deep sea dredgings near Florida.

NELSON, EDWARD, Georgetown, Mass. An Alcoholic collection of Native Insects from the vicinity of Georgetown.

NELSON, S. A., Georgetown. Chicken Snakes from that place; 2 Skulls of Common Cats, Carapace and Sternum of Glyptemys insculpta; partial Skeleton of Chelydra serpentina, and 4 nests of the Chimney Swallow.

NELSON, WILLIAM, Agent Panama Railroad at Panama. 12 Stone beads and a pendant from Chiriqui, Central America.

NEWCOMB, R. L., Salem. Mounted specimen of Woodcock (nestling) from Beverly; mounted specimen of Larus Smithsonianus; a specimen of Coluber constrictor and several spiders from Salem. Quartz, Porphyry, and Agate Pebbles from California, and a piece of a fishing line made at the Island of Mairere from the bark of a tree.

NICHOLS, F. W., Salem. Porzana Novæboracensis from Miles River, Wenham; Æschna grandis from Salem.

NORRIS, CHARLES H., Salem. An alcoholic specimen of Goliathus sp. from Acara, West Coast of Africa, collected by John Coker.

OLIVER, H. K., Salem. Hair from the head of an Egyptian Mummy; Samples of Bread made by the Navajo Indians from Blue Corn, brought home by Col. A. W. Evans, U. S. Cavalry.

OLLCOT, MARION, Birmingham, N. Y. A Flint Arrowhead found near the Au Sable Falls, N. Y.

ORNE, Mrs., Pontotoc, Miss. Southern Clover from near that place.

ORTON, Prof. JAMES, Poughkeepsie, N. Y. A collection of Insects made 2000 miles from the mouth of the Amazon, Pebas, Equador. Lepidoptera (nocturnal) and Dragon Flies from the Upper Amazon, collected by Mr. Hauxwell; Oxysternus conspicillatus ♂, ♀, from Guayaquil; Chrysophora chrysochlora from Napo, and Eggs of Corydalis from Napo Wilderness.

OSGOOD, ALFRED, Newburyport. 21 Stone Arrowheads, an Axe and a piece of a broken Pipe, from the vicinity of 41 Marlboro street, Newburyport; 2 pieces of Serpentine from Newbury, and a piece of Fossil wood from California.

OSGOOD, J. C., Salem. 2 specimens Attacus Luna from Salem.

OSGOOD, J. B. F., Salem. Specimen of Sarcodes sanguinea. Snow Plant from Lake Tahoe.

OSGOOD, NATHANIEL S. 2 species Radiates from Massachusetts. 2 species Mollusks from Amity river, La.

PACKARD, A. S., Jr., Salem. Young Musk Rat from the vicinity of Salem; 3 sp. Salamanders from Amherst, Mass.; Fishes, Reptiles, Mollusks, Radiates from Key West, Fla.; a large collection of Articulates from Ft. Macon, N. C. Insects from Nantucket, Salem and Amherst, Mass., Brunswick, Me., Galls from Princeton, N. J., Bark Lice injurious to the cotton; Sapadilla, Almond, Olive and other tropical plants from Key West, Fla.; specimen of Lingula pyramidatus (Stimp.) from Ft. Macon; 18 species Mollusca from Nantucket; Custard Apple from Florida; Fossils from Turner's Falls, Mass.; Labradorite from Boulder at Marblehead, and Orthoclase from Topsham, Me.

PAGE, J. M., Salem. Triton sp. from Swampscott, Mass.

PAGE, Miss ANNIE L., Danvers. Native Sponge from Marblehead.

PAIGE, H., Keeseville, N. Y. Four Arrowheads found in Chesterfield, N. Y.

PARSONS, J. M., Salem. Living specimens of Pecten tenuicostata from George's Bank.

PATCH, B. W., Hamilton, Mass. Specimens of Astur atricapillus; a species of Belostoma; a Stone Axe and Arrowheads from Hamilton.

PATTERSON, W. A. A piece of Pompey's Pillar.

PEABODY, H., Salem. Java Deer. Dried Flowers from Cape of Good Hope.

PEASE, W. H., Honolulu, Sandwich Islands. A collection of Shells (recent) and a fossil Oyster from Sandwich Islands; Skull of a Polar Bear. A second collection of 673 specimens, 197 species of Shells from the Sandwich Islands.

PEIRCE, J. Sample of Gould's Alkaline Phosphate.

PIERCE, Miss JENNIE, Canton, Mass. Membracis sp. from Canton, Mass.

PERKINS, Dr. G. A., Salem. Hammock made by the Mandingoes, W. C. Africa; Cloth made by the natives on the Gold Coast; a Trumpet made of the horn of an Antelope, and two Knives used by the Gnebos, Cape Palmas; Rattle worn by Greegree Men; Charms worn on Neck and Wrist, from Cape Palmas; Fibre from East Indies used for Ropes and Brooms; Pod of Acacia; Sample of material for making Cloth, from Cape Palmas; a small bale of Snuff from Zanzibar; Seed Pod from Cuba; Coffee, Nutmegs, and the Saw of a Saw Fish; a piece of Elm tree bored by Termites, from Salem Common.

PERKINS, Capt. J. WARREN, Salem. Skulls of a Walrus and of a Polar Bear.

PERLEY, J., Salem. Scolopendra sp. from Sulphur Springs, Fla.

PETTINGILL, Mr., Salem. A dried preparation of the Gills of a Cod.

PETERSON, G. W., Salem. Limulus Polyphemus from Salem.

PHILLIPS, O., Peabody. Star-nosed Mole, killed in Peabody.

PHILLIPS, Miss LIZZIE. Triton dorsalis from Campton, N. H.

PHIPPEN, GEORGE D., Salem. Bow and Arrows from ?

PHIPPEN, N., Salem. Lead Ore from the Plymouth Mine, Plymouth Co., Vt.

PIKE, Lieut. ALBERT S., U. S. A., Ft. Jefferson. Squilla from Tortugas, Fla.

POOLE, J. H., Peabody, Mass. Malformed Pig.

POPE, CHARLES S., Salem. Salamander from Salem.

PORTER, WM., Jr., Salem. Nest of Baltimore Oriole.

PORTLAND SOCIETY OF NATURAL HISTORY, Portland, Me. 3 specimens of Liparis sp., found among Eel grass in Portland Harbor, collected by C. B. Fuller.

PRINCE, Miss H. J., Beverly. Specimens of Venus gemma from Beverly.

PROPRIETOR OF PLUM ISLAND HOUSE, Newburyport. Bucephala albeola from Plum Island.

PUTNAM, CHARLES, Salem. Piece of High Rock, Saratoga.

PUTNAM, F. W., Salem. Insects injurious to vegetation. 3 Arrowheads found near the Au Sable Chasm, N. Y.

Putnam, George G., Salem. Moth from Salem.

Ravenell, H. W., Aiken, S. C. A collection of 194 species of Fungi.

Ray, A., Topsfield. Living specimen of Triton violacea from that place.

Raymond, R. L. Homarus Americanus (young) from Marblehead, Mass.

Ricker, Mrs. A Pine Cone from Nevada.

Ricksecker, L. E., Nazareth, Pa. Lepidoptera, Orthoptera, Cicada, Gordius, and Amphipods, from Wahsatch Mountains, Utah; also 2 Fossil Fishes, and a Burrowing Cricket.

Rider, J. J., Salem. A Whip or Cane made by Arabs at Senegambia, Africa, from the tail of a Skate.

Riva, Charles, Wenham. Triton violacea from Wenham.

Roberts, E. F., Salem. Tabanus atratus, and Tachina vivida from vicinity of Salem.

Robinson, John, Salem. Insects from Salem.

Ropes, Wm., Salem. Grasshoppers from vicinity of Salem.

Roundy, Capt. H., Salem. A Chinese God corresponding to the Greek God Ceres, dug up from the basement of the worshippers' hall, in an ancient temple in China.

Rowell, John B., Tortugas. Hermit crab from Tortugas, Florida.

Russell, Prof. J. L., Salem. Field Mouse from Salem; Larvæ of, and leaves eaten by, Haltica chalybea, on Hartford Seedling, from East Medford; Philloxera vitifoliæ from Dansville, N. Y.; specimens of Hottentot Fig; the fruit of Mesembryanthemum acinifolium from Cape of Good Hope, and a Stone Arrowhead.

Sampson, Theodore. Plants collected in the neighborhood of Canton and Hong Kong, in 1868–9.

Savory, T. T., Salem. Living specimen of Red Shouldered Hawk.

Scudder, S. H., Boston. Moths and Hymenoptera from Florida.

Sears, John, Danvers. A Stone Hatchet from Danvers; cast of Fossil Shells from Iowa, and Carbonate of Lime from Danvers; 2 specimens of Woodpecker (Picus villosus) shot at Wenham.

Severance, Alphonso, M. D., Salmon Falls, N. H. Native Cap from Aspinwall.

Shaw, B. E., Salem. A framed Photograph of the Hairy Family of Ava, Burmah, and one of a group of Natives of the Andaman Islands.

Shaw, John H., Marblehead. Little Phalerope from Marblehead.

Shaw, X. H., Salem. Diapheromera femoratum from Salem.

Shepard, Frank, Salem. Attacus Luna from Salem.

Shirley, F. Embryo Musk Rats taken about May 3d, 1869.

Shreve, Dr. S. V., Salem. An earthen Water Jar from China.

Silsbee, William H., Salem. Fishes, Crustaceans, Radiates and Mollusks in Alcohol, from along the north shore of Massachusetts Bay. Galls made by various Insects, from the vicinity of Salem. Cocoon of Telea Polyphemus from Beverly. Chrysalids from the vicinity of Beverly. Flowers of the Sarracenia purpurea, of a bright lemon color, found in Beverly woods. A wooden implement from the Pacific Islands. Parasites from the Red-winged Blackbird.

Simes, Henry O., Salem. Accipiter fuscus and Larus argentatus, shot in Salem, Mass.; Cicada septendecim from Andover, Mass.

Simmons, Mrs., Salem. Skull of a Bull Dog.

Simonds, S. S. Rattles from a Snake killed in parish of Assumption, La.

Skidmore, Elias S. 13 Carnelian Pebbles from the banks of the Mississippi.

Smead, D. W. Skull of Woodchuck having one of the upper incisors grown round in a double coil, from Au Sable Forks, N. Y.

Smith, A. A., Salem. A Three Legged Chicken.

Smith, C. S., Lt. U. S. A., Ft. Macon, N. C. Crustacea and Worms from Ft. Macon.

Smith, J. Alden. A collection of Minerals and Ores from various localities, principally from Colorado.

Smith, Lovell, Boston. Minerals from various localities.

Smith, Patrick, Marblehead. A specimen of Night Hawk, from Marblehead.

Smith, Rushton, Waverly, N. Y. Stone Arrowhead from banks of the Delaware River, Pike Co., Pa., and two Arrowheads from Tioga Co., N. Y.

Smithsonian Institution, Washington, D. C. 42 Birdskins from Costa Rica and other localities; a collection of 33 packages of Infusorial earths from various localities; collection of Birds' Eggs from various localities.

Spalding, George, Newburyport. Fœtal Porpoise and a Whale Louse.

Staniford, John F. Mollusks from Banks of Newfoundland.

Starr, F. W., Philadelphia. 2 Microscopic Slides of Insects.

Stearns, R. E. C., San Francisco, Cal. Cones and Leaves of Pinus tæda and P. palustris, and a collection of Reptiles, Fishes, Crustaceans and Radiates in Alcohol from Tampa Bay and vicinity; 14 specimens of Marine Shells, and 1 specimen of Sponge from Florida; 3 specimens of Cassidula corona from a Mound near Rocky Point, Fla.; 1 Purpura ostrina (fossil) from Monterey, Cal.; 1 Chlorostoma sp.; specimen of Leptogorgia virgulata (of M. Edw.) from Long Key, Gulf of Mexico; Pieces of the ribs of Manatee (fossil); 11 specimens of Fossil Coral and Chalcedony from Ballast Point, Tampa Bay; a piece of wood gnawed by Beavers, and Shells, pieces of Pottery, etc., from the shellheaps and mounds in Florida.

Stebbins, Solomon, Springfield, Mass. A collection of Reptiles from about Springfield, and two Rattlesnakes from Mt. Tom.

Sternburg, J. H., Panama. A collection of Reptiles, Fishes, Insects, and Crustaceans from Panama.

Stewart, Joseph, U. S. A., Ft. Macon, N. C., Crustacea and Worms from Ft. Macon.

Stickney, Miss Hannah. Native Cloth from some of the South Sea Islands.

Stickney, Joseph A., Salem. 3 Specimens of Epeira and their Eggs.

Stone, Henry. Minerals from the British Provinces.

Stone, H. O. Female Canker Worm and Solenobia? larvæ from Framingham.

Stone, James, Beverly. Polyzoa from the Grand Banks of Newfoundland.

Stone, Miss Martha, Chicopee. Insects, alcoholic and dried, from Aiken, S. C.

Stone, William, Ipswich. A Stone Pestle found near Eagle Hill, Ipswich.

Stone, Maj. Wm., U. S. A. Insects from Georgia and other localities; Fossils from Lowell, Kentucky. Insects from Aiken, S. C.

Story, Mr., Beverly. Corydalis from woods in Beverly.

Strobel, Mr., Baltimore. Two specimens of Nerita pleloronta, from Key West.

Swasey, Mrs. John. Skeleton of Merganser.

Sydell, Dr. F., Chinandega, Nic. A beautiful and highly polished Chisel, made of a Green Stone, found standing erect in the ground on his plantation, after a heavy rain; another similar to this, and a box 6 inches long by 4½ wide and 2½ deep, of like material, were found with it in a line and near together. 2 living specimens ♂, ♀, of the Pavon, from Chinandega, Nic.

Thompson, Waldo, Swampscott. Eggs of Buccinum undulatum.

Tilton, S. E., Boston. Quartz Crystals.

Tucker, Jonathan, Salem. 2 Cases of Chinese Insects; an Earthen Water Jar from Sumatra, and a pair of Antlers of the Red Deer.

Tucker, Joseph, Chicago, Ill. 16 pieces of Wampum from the great Monnd at St. Louis, Mo.

Tullock, Charles F., Salem. Telea Polyphemus from Salem.

Turner, R. S. Coleopterous larvæ injuring Elm; Lepidopterous pupæ, and Cocoon of Platysamia Cecropia from Morristown, N. J.

Tuttle, Jesse C., Salem. Salamander from Salem.

Tyrrell, Mrs. S., Methuen. Dress made of Seal Intestine, probably from the North West Coast of America.

Twist, Mrs., Peabody. Triton violaceus from that place.

Uhler, P. R., Baltimore, Md. Aspidiotus n. sp. on Bamboo.

Upton, Robert, Salem. Partial skeleton of Guillemot.

Upton, John B., Sierra Leone, W. C. Africa. 5 Snakes from Sierra Leone.

Valentine, Miss Margaret P., Salem. Pieces of Roman Pavement discovered at Ponsonby, England.

Veach, Charles, Keytesville, Mo. 7 specimens of Land Shells from that vicinity, and alcoholic specimens of Mollusca from Chariton Co., Mo.

Verrill, Prof. A. E., Yale College, New Haven, Conn. Specimen of Sagitta sp. from Eastport, and a collection of Radiates from various localities.

Very, Lewis, Salem. Specimens of Telea Polyphemus from Salem.

Walcott, A. F., New York. 2 Musical Instruments from Siam.

Walcott, Charles F., Cambridge. A Stone Sinker found at Marblehead.

Walker, C. A., Chelsea. Pandion Carolinensis taken at sea. 20 specimens, 12 species of Birds from the vicinity of Lynn and Chelsea; Stone Gouge dug up in his garden in Chelsea.

Walker, Samuel L., Salem. Specimens of smooth backed Flounder taken in Salem Harbor.

Ward, James L., Salem. 2 specimens of Loon (Colymbus torquatus), and one of Lomvia Svarbag Coues, from the vicinity of Salem; Parasitic Crustacean from the mouth of a Smelt, taken in Salem harbor.

Waters, D. P., Salem. Larus Smithsonianus (young), and Philohela minor (young) from Salem.

Watson, George P., Salem. Mica, Tourmaline, Garnets, Quartz, etc., from Grafton, N. H.

Webb, Benjamin, Jr. Salem. Coleoptera found in a Gin Case from Holland.

Webb, Mrs. Wm. G., Salem. A Bird from Zanzibar.

Webster, N. B. 92 specimens of Teeth of fossil Squalidæ, etc., and 4 spines of an Echinoderm from Dauphin Co., N. C., Marlbeds.

Wells, Miss Mary E., Burlington, Vt. A Stone Gouge and portion of a Stone Knife found in Peru, N. Y.

West, B. A., Salem. Skull of a 4-Horned Ram from Western Africa.

West, Miss Ella, Salem. Song Sparrow from Salem.

West, W. S., Salem. Nest and Eggs of Turdus migratorius from Salem.

West, Mrs. William S., Salem. Eggs of Robin and Canary.

Williams, John, Salem. Brown Bat taken in Salem.

Willard, Capt. B. J., Portland. A Porpoise taken off Portland.

Willis, John G., Salem. Spear from the East Coast of Africa.

Winn, J. K., U. S. Steamer Gettysburg. Specimens of the Sea bottom obtained in 420 fathoms, off Havana (Moro Castle S. S. W. 3 miles), also a chart of the bottom from Kingston to Aspinwall. A collection of Deep Sea Soundings from the Gulf of Mexico, from 234 to 1230 fathoms.

Wheatland, Miss M. G., Salem. Cuvieria squamata from Isles of Shoals.

Wheatland, Miss, Salem. Desmocerus palliatus and Caterpillar from Salem.

White, G. M., Salem. Agate pebbles.

Wolf, John. Microdon globosus larvæ from Ellisville, Fla. 2 species Mollusca from Canton, Ill.

Woodbury, Ezra L., Salem. Specimen of Common Brown Bat, taken in Salem.

Wright, Charles. Lice from Cat from Weathersfield, Conn; Bark-lice from Bark of Tabernae montanae.

Wyman, H. B., Peabody. A Quartz Arrowhead from near Washington, D. C.

C. Cooke, *Assistant.*

Peabody Academy of Science,
Salem, December 31, 1870.

Mus.120.26.7.13

FOURTH

ANNUAL REPORT

OF

THE TRUSTEES

OF THE

PEABODY ACADEMY OF SCIENCE,

FOR THE YEAR 1871.

SALEM:
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1872.

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TRUSTEES AND OFFICERS OF THE ACADEMY

FOR THE YEAR 1872.

TRUSTEES.

Asa Gray, Cambridge, Mass.
William C. Endicott, Salem, Mass.
G. Peabody Russell, Bristol, R. I.
Othniel C. Marsh, New Haven, Conn.
Henry Wheatland, Salem, Mass.
Abner C. Goodell, Jr., Salem, Mass.
James R. Nichols, Haverhill, Mass.
Henry C. Perkins, Newburyport, Mass.
S. Endicott Peabody, London.

Finance Committee. — Messrs. Endicott, Nichols and Goodell.

Executive Committee. — Messrs. Endicott, Wheatland, Goodell, Nichols and Perkins.

OFFICERS.

President.—W. C. Endicott.
Vice President.—Henry Wheatland.
Secretary of the Trustees.—A. C. Goodell, Jr.
Treasurer.—J. R. Nichols.
Director of the Museum.—F. W. Putnam.
Secretary of the Council.—A. S. Packard, Jr.
Curators.—F. W. Putnam and A. S. Packard, Jr.
Assistant in the Museum.—Caleb Cooke.
Director's Clerk.—W. S. West.
Treasurer's Clerk.—B. W. Russell.

COUNCIL.

The Council consists of the President, Vice President, Secretary of the Trustees, Treasurer, Director, and the Curators.

FOURTH ANNUAL REPORT

OF THE

PEABODY ACADEMY OF SCIENCE

FOR THE YEAR 1871.

SATURDAY, JANUARY 6, 1872.

THE annual meeting, which was duly notified for this day at 11 A. M., was adjourned to January 13, 1872, at the same hour, and the Secretary was requested to notify the members of the Board not present.

SATURDAY, JANUARY 13, 1872.

The annual meeting of the Board which had been adjourned to this day, was held, according to adjournment, at 11 A. M.—Present, Messrs. Gray, Endicott, Wheatland, Goodell, and Perkins.

Report of the Council was read, accepted, and ordered to be printed.

Report of the Treasurer was read, accepted, and ordered to be printed.

The following officers were elected for the year ensuing and until others shall be chosen in their stead.

President.—WILLIAM C. ENDICOTT.

Vice President.—HENRY WHEATLAND.

Secretary.—ABNER C. GOODELL, JR.

Treasurer.—JAMES R. NICHOLS.

Executive Committee.—William C. Endicott, Henry Wheatland, Abner C. Goodell, Jr., James R. Nichols, and Henry C. Perkins.

Finance Committee.—William C. Endicott, James R. Nichols, and Abner C. Goodell, Jr.

The appropriations for the year were made.

Adjourned.

REPORT OF THE FINANCE COMMITTEE FOR 1871.

THE Finance Committee submit the following report for the year ending January 15th, 1872.

The Permanent Fund remains as by last report at $100,000. In that report the Treasurer stated that he hoped during 1871 to pay a portion of the debt of $5,400 then outstanding, but this hope has not been fulfilled, and the debt remains the same. But the committee are confident that a large reduction will be made during the ensuing year.

The following account exhibits the receipts and expenditures since January 15, 1871, the date of the last report.

Cash on hand January 15th, 1871,		$ 18 39
Income from Jan. 15th, 1871 to Jan. 15th, 1872,		8838 54
		8856 93
Arrears of 1870,	$ 699 36	
Expenses of the Museum, including all salaries and other charges to date,	5448 98	
Repairs on Marine Building,	146 07	
" " King "	134 47	
Salem Press for printing reports, etc.,	437 87	
Treasurer's Clerk,	300 00	
State, County and City Tax,	442 00	
Watchman,	296 56	
Interest,	399 11	
Insurance,	295 00	
Farnum, care of King Building,	24 50	
Salem Gas Co.,	8 64	
Salem and Danvers Aqueduct,	21 00	
Incidental Expenses,	46 50	
Cash on hand,	156 87	
		$8856 93

WM. C. ENDICOTT,

for the Finance Committee.

Salem, Jan. 15th, 1872,

REPORT OF THE COUNCIL FOR 1871.

To the Trustees of the Peabody Academy of Science.

Gentlemen: In accordance with the vote of the Council, I have the honor to transmit, for your consideration, the accompanying documents as the Annual Report of the Council to the Board of Trustees of the Academy.

Respectfully,

A. S. Packard, Jr.,

Secretary of the Council.

REPORT OF THE DIRECTOR FOR THE YEAR 1871.

IN accordance with the instructions of the Trustees, the operations of the working corps of the Academy have been limited strictly to the care of the specimens in the Museum and the proper disposition of the many additions. Thus, being obliged to keep all expenditures within very narrow limits, in order not to exceed the amount which the Trustees appropriated for the expenses of the year, I have not felt authorized to engage in any movement that would add to the necessary expenses of the Museum. Therefore, though the year has by no means been one of quiescence, it has not been so full of special work as those preceding.

It must be borne in mind that with a large Museum to attend to, and only Dr. Packard, Mr. Cooke and myself in special charge of it; with no means at hand to provide bottles, alcohol, boxes and new cases to an extent sufficient for the proper arrangement of all departments, and the new specimens almost daily received to be cared for, it was impossible for us to do much more than keep the specimens in safety and add to the collection on exhibition such as could be introduced into the cases without causing a special expenditure. Our work in the Museum during the year may be stated in general terms as follows: —

1st. The addition to the collection on exhibition of a large number of Insects, identified and arranged by Dr. Packard, and the arrangement of a many times larger number in the insect cases that have been provided for their accommodation in the work rooms. Dr. Packard has also continued the work of identifying and arranging the Crustacea, in which he has been greatly assisted by Mr. Smith, of the Yale Museum.

2d. The Archæological collection has been very largely increased during the year, and the cases formerly considered as sufficient for the collection are now overcrowded, and many hundred specimens in our possession cannot be exhibited until more case room is provided, or a rearrangement made, so as only to keep a typical series on exhibition and to store the rest. In this department we have received great assistance from Mr. Alfred Osgood of Newburyport, who has not only collected a large number of stone implements in his vicinity, which he has kindly given to the Academy, but has also explored the vicinity of the mouth of the Merrimac and adjoining coast of the county for shell heaps and other relics of the past inhabitants, and has mapped for us quite a number of old Indian stations, several of which should receive further investigation. Among the interesting specimens which we have received from Mr. Osgood is a unique arrowpoint made of a substance so closely resembling junk-bottle glass as to make it of great importance to have it definitely determined. This interesting specimen was found, in connection with other arrowpoints, on the land of Mr. Osgood in Newburyport, by Mr. Stephen Peabody. Another kind friend, Dr. C. C. Abbott of Trenton, N. J., has sent us a fine collection of about a hundred typical specimens of the various stone implements found in New Jersey. These are specially interesting to our collection as they are the specimens now in course of being engraved for an article by Dr. Abbott on the "Stone Implements in New Jersey," and were selected by him as typical of the various forms found there. Dr. Abbott has also sent us a fine flint dagger from Denmark. Among the most important additions from our county are the specimens collected in the Indian graves at Beverly in July last, and presented by Mr. John Lovett of Beverly, and Messrs. John Felt, David Moore, C. Cooke and myself. These implements will soon be described and figured in detail.

3d. A number of specimens of the Land Shells have been identified and mounted on tablets by the Rev. Mr. Bolles, who has given such time as he could spare from his professional duties to gratuitous work at the Academy; and it is greatly to be hoped that he will soon be able to devote sufficient time to this department to authorize its being placed entirely in his charge, should he be willing to assume its care.

4th. Prof. Verrill of the Yale Museum has identified and labelled our collection of Ascidians, and to Dr. Horn of Philadelphia we are indebted for many identifications of our Coleoptera.

5th. The other work in connection with the arrangement of the Museum consisted in the proper placing of such specimens in the cases as it was possible to arrange without special cost, and the addition of a number of birds and other specimens to the County collection, the perfection of which is always uppermost in the minds of the officers of the Museum.

Special investigations have been continued by Dr. Packard and myself in several groups of articulates and fishes, and I here offer as an appendix to this Report, a brief paper by Dr. Packard on the

Moths sent by the United States Department of Agriculture to him for identification, and a Synopsis, by myself, of the family containing the Blindfishes of the subterranean streams of our country. I have also to request the publication of the following papers: — "Revision of North American Butterflies," by Mr. Scudder, containing special reference to those species found in Essex County; List of Coleoptera collected by Dr. Packard in Labrador and identified by Dr. Horn of Philadelphia; and the "Annual Record of American Entomology for the year 1871," edited by Dr. Packard.

During the last summer Dr. Packard, at the invitation of Prof. Baird, the United States Commissioner of Fisheries, joined the Commission at Wood's Hole and passed a week of most successful dredging and collecting, thus securing, through the kind assistance of the Commissioner and other gentlemen connected with the Commission, a number of rare and valuable specimens for our Museum. Dr. Packard has also given much attention to the collection of the minute forms of marine life in our harbor in order to perfect the County collection in this department.

With the assistance of Mr. Cooke and Mr. J. H. Emerton, I have been able to add many specimens to the Museum from the Wabash River and other points in Indiana and Kentucky, including various species from the Mammoth Cave. From this central region we had hardly a specimen, and, as it is one of great ichthyological interest, these specimens are of considerable importance. During this trip to the Wabash river we also made extended examination of an ancient fortification at Merom, Indiana, probably belonging to the time of the Mound Builders, and of a large group of mounds on the other side of the river, at Hudsonville, Ill. These examinations have, I believe, brought out several points of interest in relation to the early inhabitants of this country, which will be given in detail in an early number of the *Naturalist;* but I must in this connection mention the kind attentions which our party received from friends in the West, and to the appreciation in which our labors here at the East were everywhere held. Especially must I inform you of the assistance given us by Prof. Cox, of the Indiana Geological Survey, and his assistants, Messrs. Levette and Collett, and by Messrs. Byrkit and Gilkie, of Indianapolis, and of the courtesies extended by Mr. Fishback of the "Indianapolis Journal," Mr. Poole, the Secretary of the State Board of Agriculture, and by the State Librarian, Mr. De Sano. To Mr. T. Kearns, President Holmes, the Drs. Harper and other friends, who so hospitably entertained and aided us while at Merom, we are specially indebted. Neither must I omit to inform you of the generosity of the officers of the Terre Haute and Indianapolis and the Evansville and Crawfordsville Railroads, who furnished us with free passes for ten persons, with the privilege of getting on and off the trains at any point over the several hundred miles of the route. This liberality of the railroads of the West, which we also experienced during several other trips over various roads while in connection with the American Association for the Advancement of Science, was so open handed that we could but feel most grateful for the facilities thus extended for scientific research. This may be partially accounted for by the fact that in the West the great mineral resources which have developed so many railroads bring their officers into more immediate contact with scientists to whom they are willing to acknowledge their indebtedness.

During the past year the city has continued to furnish a special constable for the Museum on the five days of each week it has been open to the public, and 51,417 persons have visited the collection. An increase of 13,552 over the number of visitors last year, and a total of 115,410 since the Museum was opened in May, 1869. While the American Board of Foreign Missions was in session in the city the hours of entrance were extended to accommodate the guests of the city by whom our hall was very generally visited.

From the record of donations prepared by Mr. Cooke it will be seen that one hundred and twenty-eight donors have added very largely to all departments of the Museum. We have also received a large number of valuable books, principally the publications of other societies and institutions at home and abroad, in exchange for our own. These have been announced as they were received, in the numbers of the *Naturalist*, and specially acknowledged by letter when not received as direct exchanges. We thus continue to be in receipt of nearly all the most important scientific works published in all countries, which are principally forwarded to us through the agency of the Smithsonian Institution.

The *Naturalist* has continued to receive general favor and increased support from scientific men, and from the public which it is endeavoring to educate within its sphere, and the Academy has continued to reap the benefits of its publication in many direct and indirect ways, while it is yearly adding to its reputation. Kind friends have continued to give us their helping hands and welcome dollars, and we have been enabled by the publication of an extra double number, containing the papers read at the last meeting of the Association for the Advancement of Science, to open our sixth volume with the new year. The *Naturalists' Agency* is rapidly increasing in usefulness and fast extending its operations under the immediate charge of Mr. West.

It again becomes necessary for me to call your attention to the vital importance of providing the means for the publication of our *Memoirs*, for unless they are continued with promptness the Academy will necessarily lose much of the estimation in which it is now held and its advancement be crippled. The importance to an institution of making known the results of its labors by means of its publications is so great and is so aptly put by the Hon. E. G. Squier, in his recent address at the formation of the Anthropological Institute of New York, that I cannot refrain from quoting it in this connection.

"Probably no one will dissent from the proposition that no scientific society can be useful or permanent which does not publish its proceedings, summarily or otherwise, or which fails to print its memoirs with a certain degree of regularity. No man worthy of occupying the attention of any considerable number of intelligent students will prepare an elaborate memoir, full, as any reputable paper should be, of facts of present interest or for future use, for the empty honor of a vote of thanks, and a modest request for a copy for archives that do not exist."

We have now about ready for publication two short memoirs suitable for the Academy to publish in their series, and if we cannot soon secure the means for printing them we shall be under the necessity of sending them to another Institution for publication, as Dr. Packard was forced to do with his paper on the Embryology of Limulus, which, though the result of work done here, is to be printed in the Memoirs of the Boston Society of Natural History.

I know that the Academy is doing all, and even more than most institutions would think possible with its limited means, and that its Trustees are as desirous as is this Council of doing everything that its means will allow; — but should we be content with our present insufficient endowment, when a united effort on our part, in the name of an institution that has been founded for the benefit of the citizens of Essex County and for the purpose of promoting knowledge among the people, might give to it the means for carrying out in full the objects which its officers have thus far only partially succeeded in attaining? If there are reasons why we should not go to the public in the name of the Academy, then why not unite with our sister institution, and, taking advantage of her popular element, secure for the cause of science in this community an endowment sufficient to carry on the great work we have commenced? For so long as the results are attained and science is benefited; our people taught, and our principles carried out, what matters it as to the particular name of the institution through whose immediate agency it is accomplished? Our objects are of the highest, and cordial coöperation of all for their accomplishment should be our aim, and to this end we should avail ourselves of any circumstances that may occur.

Think what more ample resources would secure for our people! — A larger hall in which our museum could be more instructively arranged; a scientific survey of our county that would be a benefit and an honor to its inhabitants; the publication of elementary text and guide books, and of thoroughly scientific works and memoirs; a corps of active workers in the various branches of science, such as would make our city a central light, and whose teachings and lectures would elevate all classes of the community. Such would be the results — are they not worth trying to attain?

In closing this Report I must do justice to the memory of one who, though not directly connected with the Academy, was, during the last year of his life so closely united with us in many ways, especially by his voluntary clerical assistance, as to make him greatly missed when sickness at last kept him from us, and mourned when death released him from his suffering. I allude to my brother, the late W. H. A. Putnam, who died, in the 39th year of his age, of an organic disease of the heart contracted during exposure and shipwreck in his early years. From the age of fourteen until the year preceding his death he had led a sailor's life. Having been made second mate of an Indiaman on his second voyage as sailor, at the early age of sixteen years, he rose rapidly and soon became master; making many voyages to the East Indies, Europe, Australia and the Pacific coast of America, and during the last two years of his maritime life had command of the government steamer engaged in the work of opening the bar at the mouth of the Mississippi. Ever appreciative of Nature's work, and with a thorough education, he soon became interested in collecting specimens in all departments of zoology, and during his voyages to foreign parts unquestionably made larger collections than any other American sea captain. His earlier and later collections were made expressly for the Essex Institute and this Academy, and the many hundred choice specimens in nearly all departments of our museum, bearing his name as their collector, is evidence of what he has done for us. But as large as have been his additions to this museum, they are insignificant when compared with the immense collections with which he enriched the great Museum at Cambridge, especially in the departments of corals, echinoderms and other radiates, and in crustaceans and fishes. Prof. Agassiz, fully appreciating the value of such an active collector in distant parts, kept him supplied with a large number of cans and jars, with alcohol, which were ever returned well-filled with such as the sea would yield to him; and his cabin on a homeward voyage always had the aspect of a well stored museum. So numerous were these collections and so largely did he collect, that not only were many specimens new to science first brought home by him, as shown by the publications of the Museum of Comparative Zoology, and the species that have been named in his honor, but the material which he thus brought together, after being identified, has been distributed to museums at home and abroad; and it is not saying too much to state that there is hardly an important zoological museum in this country or in Europe which does not contain many typical specimens bearing the well known name of Captain Putnam on their labels.

Respectfully submitted to the consideration of the Council,

F. W. PUTNAM, *Director.*

Peabody Academy of Science,
Salem, December 30, 1871.

APPENDIX TO THE DIRECTOR'S REPORT.

SYNOPSIS OF THE FAMILY HETEROPYGII. BY F. W. PUTNAM.

HETEROPYGII TELLKAMPF, Müller's Arch. f. Anat., p. 392, 1844; and New York Journal of Medicine, v, p. 84, 1845.

Hypsæidæ Storer, Synopsis N. A. Fish. p. 435, 1846.

Brain of ordinary development in all its parts, similar to that of Cyprinodontes and of about the same proportions. Cerebral lobes larger than the nearly round optic lobes. Cerebellum overlapping the posterior third of the optic lobes. Medulla oblongata broad, with well defined right and left sides. (On comparing the brains of the three genera the only difference noticed was that in Chologaster the cerebellum was not quite as large proportionally, but more elongated and not quite as wide as in the other genera, while the optic lobes of this genus with well developed eyes were no larger than in a Typhlichthys of the same size.)

Skeleton not studied. Günther gives the vertebræ as thirteen abdominal and nineteen or twenty caudal. The bones of the head are thin and mostly flattened as in the Cyprinodontes. Occiput slightly convex.

Body compressed posteriorly. Head and anterior portion of body depressed, giving the form of a broad, flat head, with a compressed tail.

Branchiostegal rays six in number and but slightly covered by opercular bones; opercular opening large.

Fins. Dorsal and anal nearly opposite and posterior to centre of body. All the fins except the ventrals well developed, with central rays longest and first rays simple. Pectorals close to the head, about in the middle of the sides. (Ventrals present in Amblyopsis, absent in Typhlichthys and Chologaster.)

Mouth opening upwards, with lower jaw slightly projecting. Margin of the upper jaw formed by the intermaxillaries. Maxillaries placed behind the intermaxillaries, with lower third broad and below the intermaxillaries. Several rows of fine teeth on the intermaxillaries and lower jaw. (Teeth on palatines in Amblyopsis and Typhlichthys, none on these bones in adults of Chologaster.)

Scales. None on the head. Body closely covered with small, partially imbedded cycloid scales, irregularly arranged.

Lateral line absent.

Nostrils double. Anterior tubular and standing out from the end of the snout.

Stomach well defined, cœcal.

Pyloric appendages present.

Intestine with two turns.

Anus situated under the throat and forward of the pectorals.

Ovary single. (Placed by the side of the stomach in Amblyopsis and Typhlichthys and behind it in Chologaster.)

Viviparous. (Amblyopsis.)

Testes paired. (Amblyopsis.)

Air bladder with pneumatic duct. (Amblyopsis.)

Liver with the left lobe very large and partially enclosing the stomach.

Amblyopsis DeKay, Fishes of New York, p. 187, 1842.

Eyes rudimentary and imbedded under the skin.

Head with numerous transverse and longitudinal rows of sensitive papillæ provided with nerve branches, many of the nerve branches terminating as free filaments outside the papillæ. Small granulations on the spaces between the papillary ridges. Canals under the skin.

Teeth minute, curved, and arranged in rows on the intermaxillary, inferior maxillary and palatine bones.

Body with a prominent papilla just over the opercular opening, at the base of a small papillary ridge similar to those on the head. Papillary ridges on sides of body of same character as those on the head, and arranged at nearly equal distances from opercular opening to base of caudal fin.

Pyloric appendages, one on each side.

Ovary situated on the right side of the stomach.

Fins. Ventrals small and placed near the anal fin. Dorsal, 9. Anal, 9. Pectoral, 11. Ventral, 4. Caudal, 24.

Amblyopsis spelæus DeKay. Large Blindfish.

Craige. Procd. Acad. Nat. Sci. Philad., i, p. 175, 1842. DeKay, Fishes N. Y., p. 187, 1842. Wyman, Amer. Jour. Sci., xlv, p. 94, 1843; Ann. Mag. Nat. Hist., xii, p. 298., 1843. Thompson, Ann. Mag. Nat. Hist., xiii, p. 111, 1844. Tellkampf, Müller's Arch. f. Anat., p. 392, 1844; N. Y. Jour. Medicine, v, p. 84, with plate, giving three figs. of the fish; position of internal organs; brain; stomach; air bladder; scale (profile view gives the fish *without* ventral fins, but ventral view shows them), 1845. Storer, Synopsis N. A. Fish, p. 435, 1846. Owen, Lect. Comp. Anat. Fishes, pp.

175, 202 (fig. of brain), 1846. **WYMAN**, Procd. Boston Soc. Nat. Hist., iii, p. 349, 1850. "**DALTON**, N. Y. Medical Times. ii, p. 354, 18—." **AGASSIZ**, Amer. Jour. Sci. xi. p. 128, 1851. **WYMAN**, Procd. Boston Soc. Nat. Hist., iv, p. 395 (1853), 1854; v, p. 18, 1854; Amer. Jour. Sci., xvii, p. 259, 1854 (with figs. of brain, eye, and otolite). **GIRARD**, Proc. Nat. Sci. Philad., p. 63, 1859. **POEY**, Mem. de Cuba, ii, p. 104, Pls. 9, 11 (outlines of fish and of brain), 1858. **WOOD**, Ill. Nat. Hist., iii, p. 314, figure, 1862. **TENNEY**, Nat. Hist., p. 344, figure, 1865. **GÜNTHER**, Cat. Fish Brit. Museum, vii, p. 2, 1868. **COPE**, Ann. Mag. Nat. Hist., viii, p. 368, 1871. **PUTNAM**, Amer. Nat., vi, p. 6 et seq., with figs., Jan., 1872. **WYMAN**, Mss. notes and drawings in Putnam, Amer. Nat., vi, p. 16 et seq., 1872. **PUTNAM**, Amer. Nat., vi. p. 116. Feb., 1872 (additional note on the young).

PLATE 1 (American Naturalist, Vol. vi, Jan., 1872). FIG. 1. Brain, nerves and organ of hearing of *Amblyopsis spelæus*; enlarged; *a*, olfactory lobes and nerves; *b*, cerebral lobes; *c*, optic lobes; *d*, cerebellum; *e*, organ of hearing, showing the semicircular canals, with the otolite represented in place by the dotted lines; *f*, medulla oblongata; *g*, optic nerves and eye specks. FIG. 2. Otolite, enlarged. FIG. 3. Eye, magnified (natural size one-sixteenth of an inch in length); *a*, optic nerve; *b*, sclerotic membrane; *c*, layer of colorless cells; *d*, layer of pigment cells (iris ?); *e*, lens. FIG. 4. Lens, enlarged and showing the cells. FIG. 5. Eye, enlarged, showing the muscular bands, *a*, *a*, *a*, *a*; *b*, the lens pressed out of place; *c*, the optic nerve. FIG. 6. Top of head, showing canals under the skin, natural size. The two black dots and lines indicate the eyes and optic nerves in position. FIG. 7. Top of head, showing the arrangement of the ridges of papillæ, nat. size. FIG. 8. One of the ridges of papillæ from the head, magnified. FIG. 9. Three of the papillæ from the ridge, still more magnified, showing the cup-shaped summit and projecting filament. Fig. 10. A portion of the ridge magnified, and treated with acid, to show the arrangement of the nervous plexus supplying the papillæ with nervous filaments from a branch (*a*) of the fifth pair. FIG. 11. Epithelial cells from the head. FIG. 12. Epithelial cells from the body.

PLATE 2. FIG. 1. Natural size; 1*a*, stomach and pyloric appendages, twice nat. size; 1*b*, scale, magnified (nat. size represented by the small outline on the left over the figure); 1c, abdominal cavity, showing position of stomach and single ovary, nat. size.

Head more than half as wide as it is long. Length of head, from tip of jaw to end of operculum, contained nearly twice in length of body from operculum to base of caudal fin.

Dorsal and anal fins of equal size, rounded, anal commences under third ray of dorsal.

Pectorals pointed, reaching to commencement of dorsal.

Ventrals pointed, nearly reaching to commencement of anal.

Caudal broad, long and pointed, membrane, enclosing simple rays above and below, continuing slightly on the tail.

Scales small, longer than broad, with quadrangular centre and from 8 to 12 concentric lines, which are broken and reduced in number anteriorly and crossed by numerous radiating furrows posteriorly.*

Colorless, or nearly so, with transparent fins.

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* The scales described were in every instance taken from the 2d or 3d row under the dorsal fin.

Measurements. Largest specimen, 4·5 inches total length. Smallest specimen, 1·9 total length.

Geographical distribution. Subterranean streams in Kentucky and Indiana.

Specimens examined:—

PROF. WYMAN'S COLLECTION.

7 specimens. Half grown and adults. Mammoth Cave.

MUSEUM OF COMPARATIVE ZOOLOGY.

7 specimens. No. 778. Half grown and ♂ ♀ adults. Mammoth Cave.
1 specimen. No.—. Two-thirds grown. Cave near Lost River, Orange Co., Ind.

BOSTON SOCIETY OF NATURAL HISTORY.

2 specimens. No. 840. Half grown. Mammoth Cave.

PEABODY ACADEMY OF SCIENCE.

1 specimen. No. 520. Adult ♀. Mammoth Cave. Presented to Essex Institute in 1851 by N. Silsbee.

Other specimens. Dr. Günther mentions six specimens and a skeleton in the British Museum. Mr. Thompson, an adult and newly born young in the collection of the Natural History Society of Belfast. Dr. Steindachner has recently sent an adult and eight young to the Vienna Museum. The first specimen of which we have any record was presented to the Academy of Natural Sciences of Philadelphia; the second is the one described by DeKay and then in the Lyceum of Natural History of New York. Prof. Cope obtained three specimens from the waters of Wyandotte Cave in Indiana. Dr. Tellkampf had several specimens from the Mammoth Cave, and it is probable that specimens exist in nearly all the principal museums and in many private collections, as about all that have been caught in the Mammoth Cave for years have been sold by the guides to visitors.

Habits. But little is known of the habits of the large blindfish. Dr. Tellkampf states that they are solitary; on the slightest motion of the water they dart off a short distance, and that they are mostly found near stones or rocks on the bottom, and seldom come to the surface of the water. Prof. Cope states that if they are not alarmed they come to the surface to feed, swim in full sight, and can then be easily captured if perfect silence is preserved. He also thinks that they are principally surface feeders.

In the stomachs of several that I have opened the only remains found were those of Crayfish. In one specimen, opened by Dr. Wyman, a small fish with well developed eyes was found in the stomach. (See Amer. Nat., vi, p. 13, Pl. 1, fig. 13.)

The eggs are well developed in September, and the young are born about the middle to last of October. The young when born are half an inch or less in length, and are *without* external eyes. (See Amer. Nat., Feb., 1872. The young there mentioned may possibly be those of Typhlichthys.)

Typhlichthys Girard, Procd. Acad. Nat. Sci. Philad., p. 63, 1859.

Eyes rudimentary and imbedded under the skin.

Head. The same arrangement of rows of sensitive papillæ as in Amblyopsis, and the spaces between the papillæ with granulations as in that genus. (The subcutaneous canals probably exist, but have not yet been made out.)

Teeth, as in Amblyopsis, on the maxillaries and palatines.

Body with papilla over opercular opening, and with the papillary ridges on the sides as in Amblyopsis.

Pyloric appendages one on each side as in Amblyopsis, but of slightly different proportion and shape. (Stomach not so pointed behind as in Amblyopsis.)

Ovary situated on right side of stomach, as in Amblyopsis. (Eggs fewer in number and proportionately larger than in Amblyopsis.)

Fins. Ventrals *absent.* Dorsal, 7 or 8; Anal, 7 or 8; Pectoral, 12; Caudal 24. (This formula is given after counting several specimens. Girard gives, D. 7; A. 8; P. 11; C. 23.)

It will be noticed that the only characters separating this genus from Amblyopsis are the *absence of ventral fins*, the shape of the stomach and pyloric appendages, and larger eggs in less number.

Typhlichthys subterraneus Girard. Small Blindfish.

Girard, Procd. Acad. Nat. Sci. Philad., p. 63, 1859. Günther, Cat. Fish Brit. Museum, vii, p. 2, 1868 (as a syn. of Amblyopsis). Putnam, Amer. Nat., vi, p. 20 et seq., with figs., Jan., 1872.

Plate 2 (Amer. Nat., Vol. vi., Jan., 1872). Fig. 3, slightly more than natural size; 3*a*, stomach and pyloric appendages, twice nat. size; 3*b*, scale, magnified (nat. size represented by small outline over the figure).

Proportions and general appearance, want of color, arrangement of papillary ridges, position and shape of fins as in Amblyopsis spelæus, with the exception that, owing to the jaws being more obtusely rounded, the head is slightly blunter and broader forward.

Membrane of caudal quite prominent and extending forwards to posterior base of dorsal and anal fins.

Scales broader than long. Large quadrangular centre with from 6 to 8 concentric lines reduced in number and broken up on anterior margin. Posterior portion with numerous radiating furrows.

Measurements. Largest specimen, 1·85 inches in total length. Smallest specimen, 1·45 inches in total length.

Geographical distribution. Subterranean streams in Kentucky, Tennessee and Alabama.

Specimens examined: —

MUSEUM OF COMPARATIVE ZOOLOGY.

7 specimens. No. 780. ♂ ♀. Adults. Mammoth Cave. Collected and presented by Alpheus Hyatt, Sept., 1859.
1 specimen. No. 781. Moulton, Alabama. Presented by Thomas Peters.
1 specimen. No. 782. Lebanon, Tennessee. Presented by J. M. Safford.

Other specimens. Dr. Girard described the species from a specimen in the Smithsonian Institution, taken from a well near Bowling Green, Ky. Dr. Günther mentions a specimen, in the British Museum, from the Mammoth Cave.

Habits. Nothing is known concerning the habits of this fish. It is evidently much rarer at the Mammoth Cave than the large species, to judge from the small number in collections. The fact that Mr. Hyatt obtained seven specimens when he was at the cave in September and did not get any of the other species, may indicate some peculiar location in the waters of the cave where it is more abundant than in other places. The eggs were fully developed in these specimens, but no embryos could be detected. The fish is probably viviparous, and very likely gives birth to its young in October.

Chologaster AGASSIZ, Amer. Jour. Sci., xvi, p. 135, 1853.

Eyes in normal position and well developed.

Head with small granulations on the surface of the skin. (No papillary ridges.)

Teeth minute, curved and arranged in rows on the intermaxillary and inferior maxillary bones. None on the palatines in the adults (Of the four specimens examined, the two larger (*C. cornutus*) are without palatine teeth, while the single specimen of *C. Agassizii*, which is evidently a young fish, has a few minute teeth on the palatine bones. In the smallest specimen of *C. cornutus* the mouth is abnormal, the intermaxillaries being reduced to a small central portion and there are consequently no teeth in the upper jaw, but the minute teeth on the palatines are present.*)

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*I believe this is one of those interesting cases where one set of organs, or one portion of the animal structure, takes the place of another which from accident is wanting, and that in all probability these palatine teeth, that under normal conditions would be cast off as the fish attained maturity, would have continued to exist in this specimen and answer all the purposes of the intermaxillary teeth. But that in this accidental continuance of these palatine teeth, from the mere mechanical use forced upon them, we have the first stages of the development of a distinct genus, to be characterized by permanent teeth on the palatines, and reduced upper jaw bones, as many of the developmental school would argue, I do not think will bear the test of facts observed.

A not uncommon malformation of fishes consists in the entire or partial absence of the maxillary or intermaxillary bones. I have specially noticed this among our

(*Body* without opercular papilla and papillary ridges on the sides.)

Pyloric appendages two on each side. Stomach rounded and turned slightly on the side.

Ovary situated principally behind the stomach.

Fins. Ventrals *absent.* Dorsal, 8 or 9. Anal, 8 or 9. Pectoral, 12. Caudal, 28.

This genus principally differs from Amblyopsis and Typhlichthys by the presence of eyes, the absence of papillary ridges on the head and body, by having two pyloric appendages on each side instead of one, and by the posterior position of the ovary. It agrees with Typhlichthys in the absence of the ventrals, and the young further agree by the presence of palatine teeth.

Chologaster cornutus AGASSIZ.

AGASSIZ, Amer. Jour. Sci., xvi, p. 135, 1853. GIRARD, Procd. Acad. Nat. Sci. Philad., p. 63, 1859. GÜNTHER, Cat. Fish. Brit. Museum, vii, p. 2, 1868. PUTNAM, Amer. Nat., vi, p. 21 et seq., with figs. Jan., 1872.

PLATE 2 (Amer. Nat., Vol. vi, Jan., 1872). FIG. 2. Natural size. 2*a*, stomach and pyloric appendages, twice nat. size. 2*b*, scale magnified (nat. size represented by small outline over the left of the fig). 2*c*, abdominal cavity showing stomach and single ovary behind the stomach, twice nat. size.

Head more than half as wide as it is long. Length of head, from tip of under jaw to end of operculum contained twice in length of body from operculum, to caudal fin. Width between the eyes equal to distance from eye to tip of under jaw.

Eyes of moderate size, situated just back and over the end of the maxillaries.

Dorsal and anal fins of nearly equal size, slightly rounded. Anal with slightly longer rays and commences under fourth ray of dorsal.

Pectoral fins pointed, reaching to line of commencement of dorsal.

Caudal fin pointed, about equal in length to the head. Membrane above and below extending but slightly on the tail.

Scales very small and deeply imbedded in the skin. Circular with small smooth space forward of the centre. From 15 to 20 concentric rings, cut by a few short radiating furrows on anterior, and longer and more numerous ones on posterior margin.

Intestine is a little longer than in an Amblyopsis of the same size.

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common fresh water trout (Salmo) and marine conner or sea perch (Ctenolabrus) but there have never been recorded allied genera with these characters, while the malformed specimens are hardly numerous enough to give support to the theory that such malformations are hereditary, and it is probable that each case was caused by the non-development of the parts from special cause during embryonic life, or by accident to the individual.

The two pyloric appendages on the left side are close together and broader than the two on the right side, which are wider apart, longer and more slender than the others.

Color. Yellowish brown, much darker above, lighter on sides, and light yellow on under part and sides of head, belly and under part of tail. Three longitudinal very dark brown lines on each side: the upper commencing near the middle of top of head and following along the back to base of caudal fin; the middle one commencing at the nostril and passing through the eye to upper portion of operculum, thence about in the centre of side to about the centre of base of caudal fin; the lower commences under the pectoral fin and follows the ventral curve of the body to the base of caudal fin. All three lines are darkest and broadest forward, and terminate as a series of nearly confluent dots on the tail. Central rays of the caudal dark brown, outer rays uncolored. Dorsal, anal and pectorals not colored.

Measurements. The three specimens are respectively 1·5, 2, and 2·3 inches in total length.

Geographical distribution. South Carolina.

Specimens examined:—

MUSEUM OF COMPARATIVE ZOOLOGY.

3 specimens. No. 776. Rice Ditches at Waccamaw, S. C. Presented by P. C. J. Weston, 1853. (Orig. of Agassiz.)

Habits. Nothing is known concerning the habits of this species, the only specimens observed being the three mentioned. From the fact of its having a single ovary containing a small number (about 60) of large eggs it is probable that it is viviparous.

Chologaster Agassizii PUTNAM.

PUTNAM, Amer. Nat., vi, p, 22 et seq., with figs. Jan., 1872.

PLATE 1 (Amer. Nat., Vol. vi, Jan., 1872). FIG. 4. Natural size; 4*a*, stomach and pyloric appendages, twice nat. size; 4*b*, scale magnified (nat. size shown by minute dot over left of the figure).

Head more than half as wide as it is long. Its length is contained three times in the length of the body from the operculum to the base of caudal fin.

Eyes proportionately large and placed over ends of maxillaries.

Dorsal and anal fins broken, but probably of about equal size. Anal fin commences about under fourth ray of dorsal.

Pectoral fins pointed and reaching about half way to the dorsal.

Caudal fin pointed, not quite as long as the head.

Scales very minute, longer than wide, with 4 or 5 concentric lines round a granulated centre. A few radiating furrows cut the concentric lines on the posterior margin.

Pyloric appendages and stomach about the same as in *C. cornutus.*

Color. Uniform light brown, without markings except that the base of the caudal fin is rather darker than rest of fish. Fins uncolored.

Measurements. Total length, 1·4 inches.

Geographical distribution. Subterranean streams in Tennessee.

Specimen examined:—

MUSEUM OF COMPARATIVE ZOOLOGY.

1 specimen. No. 777. From a well in Lebanon, Tenn. Presented by J. M. Safford. Jan., 1854.

This species principally differs from *C. cornutus* by having a longer body and smaller head, by having the eyes proportionately larger, and by its coloration. Nothing is known of its habits except the fact of its subterranean life. The scales of the single specimen known indicate a young fish, and it is probably not over half grown.

The four species given in this synopsis are all of the family as yet known, but that others will be discovered and the range of the present known species extended is very probable. The ditches and small streams of the lowlands of our southern coast will undoubtedly be found to be the home of numerous individuals, and perhaps of new species and genera, while the subterranean streams of the central portion of our country most likely contain other species.

A SYSTEMATIC REVISION OF SOME OF THE AMERICAN BUTTERFLIES; WITH BRIEF NOTES ON THOSE KNOWN TO OCCUR IN ESSEX COUNTY, MASS. By SAMUEL H. SCUDDER.

THE present paper gives a digest of the results reached by a critical examination of the structural features of many American butterflies — principally those of New England. The earlier stages of these insects, as well as the perfect forms have been subjected to careful study, and it is therefore hoped that the scheme will prove more satisfactory than previous arrangements of these and allied insects; brief characters have been added to all the generic groups, excepting those of the Urbicolæ (Hesperidæ Auct.); and since the dismemberment of recognized groups has been carried to an unusual extent, two generic forms have been selected (containing species common to both continents, and heretofore intimately associated) in which the generic characters appear in detail, as a means of testing, to a certain extent, the value of the subdivisions of the whole paper. In my forthcoming work on New England Butterflies, all the genera will be thus treated, and additional characters will be drawn from the genitalia and from the egg (more or less full, according as material offers), in the hope that the reproach of lepidopterists — the insufficiency of their generic descriptions — may be in part removed.

The species enumerated (except the Urbicolæ) are mainly those which will be fully treated in the volume alluded to; the range of each is here given, with the principal synonymes, in the briefest possible manner. The species known to occur in Essex County have been marked by an asterisk (*) and accompanied by a few short notes; species which will probably be found within the same limits, but not directly known by me to have been taken there, are prefixed by a dagger (†). In some instances, a few European species are added, to show better the range of the genera.

Having been long occupied in collecting material for a full discussion of the American Urbicolæ,* this part is treated in a different manner. A generic division has been attempted of all the species examined from within the limits of the United States, with the addition of a few without its borders; and to

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* Through the kind communication of Mr. W. H. Edwards, I have been enabled to examine many species from the United States, otherwise unknown to me.

ERRATA.

Page 31, line 28, for POLYCHLORUS *read* POLYCHLOROS.

Page 47, line 2, for *Telenis* read *Selenis*.

Page 52, line 1, for **MITOURI** *read* **MITOURA**.

Page 54, line 32, for LYGDARNUS *read* LYGDAMUS.

Page 56, line 16, *omit* "has never been described; it."

Page 57, *transfer* Lycæna No. 2 *to* Chrysophanus on same page.

Page 60, line 6, for PALIDNE *read* PELIDNE.

Page 60, line 15, for EURYTHAME *read* EURYTHEME.

Page 66, line 31, for *Calverlyi* read *Calverleyi*.

Page 70, line 2, for *Epay. Pityrus* read *Epar. Tityrus*.

Page 71, line 25, for THRASS *read* THRASO.

Page 71, line 12, for *Endamus* read *Eudamus*.

Page 80, line 15, for *Palatka* read *Pilatka*.

Page 83, line 2, for EUDRYAS *read* EUDAMUS.

Page 83, line 9, for *Buleuta* read *Bulenta*.

the enumeration of the species and their principal synonymes, have been appended the descriptions of some apparently new forms; but, to avoid enlarging the paper unduly, all generic details are omitted, excepting in a single instance where the genus is represented by an hitherto unknown species. The marks designating the Essex County forms, known or probable, have been given, but no further notes are added, excepting upon geographical distribution..

It cannot fail to strike the eye of the lepidopterist that many changes of nomenclature are introduced in this paper, some of a radical nature. In this respect, I have attempted to follow the strict guidance of accepted rules of zoological nomenclature, to make a faithful application of the laws of priority to the higher groups as well as to the genera, and to retain, in all cases where choice was offered, as many of the older names as possible. Where the reason of any proposed change is not apparent from the dates introduced, brief explanatory notes are added. The writer would be pleased to receive, on this portion of his paper, any early criticism which is based on an acceptance, actual or supposititious, of the circumscriptions given to the generic and higher groups.

Family **NYMPHALES** Linnæus (1758).

[NYMPHALIDÆ Steph. 1850.]

Subfamily OREADES Borkh. (1788).

[SATYRIDÆ Swains. 1840; SATYRIDI Steph. 1850.]

ŒNEIS Hübn. (1816).

[CHIONOBAS Boisd. 1833.] *Type* PAPILIO NORNA Thunb.

Head small; front full, protuberant in the middle below, narrower than the eye, no higher than broad; eyes naked; antennæ composed of from 37 to 39 joints, considerably longer than the abdomen, the distal extremity very gradually and constantly increasing in size from about the middle; palpi slender, about twice as long as the eye. Tibiæ of fore legs about one-fourth the length of the hind tibiæ; costal nervure of fore wings not very much swollen; second superior branch of subcostal originating between the base of the first branch and the tip of the cell; cell three-fifths the length of the wing; median not enlarged.

1. Œ. SEMIDEA [*Hipp. semidea* Say]. White Mountains, New Hampshire.

2. Œ. Jutta [*Oreas nub. Jutta* Hübn; *Chion. Balder* Boisd.]. Labrador, and as far south as Quebec.

ENODIA Hübn. (1816).

Type Papilio Portlandia Fabr.

Head of moderate size; front full, broadly protuberant in the middle below, narrower than the eye, a little higher than broad; eyes pilose; antennæ composed of 42 or 43 joints, a very little longer than the abdomen, increasing a very little and gradually in size on the apical fourth; palpi slender, scarcely twice as long as the eye, apical joint without erect tufts of hairs. Tibiæ of fore legs nearly one-third the length of the hind tibiæ; costal nervure of fore wings greatly swollen at the base; first two branches of the subcostal arising close to the tip of the cell; the latter less than half as long as the wing; median not enlarged.

1. E. Portlandia [*Oreas marm. Andromacha* Hübn.]. Northern United States east of Rocky Mountains.

MINOIS Hübn. (1816).

Type Papilio Phædra Linn.

Head small; front full, protuberant in the middle below, scarcely narrower than the eye, broader than high; eyes naked; antennæ consisting of from 40 to 45 joints, considerably longer than the abdomen, increasing very gradually in size on the apical third; palpi slender, more than twice as long as the eye, the apical joint with erect tufts of hair like the others. Tibiæ of fore legs nearly one-third the length of the hind tibiæ; costal nervure of fore wings greatly swollen at the base; first two branches of the subcostal arising close to the tip of the cell; the latter a little less than half as long as the wing; median a little enlarged at the base; submedian also enlarged.

* 1. M. Alope [*Pap. Alope* Fabr.]. Out of a very great number of eggs obtained in the autumn, some from New England, and some from Texas, every one hatched, but not one of the young caterpillars could be made to taste food; the eggs are longer in hatching (20 to 27 days) than any others known to me, which do not continue through the winter. Southern states to the middle of New England.

2. M. **Nephele** [*Hipp. Nephele* Kirb.]. Canada and the northern parts of the northern United States.

ARGUS Scop. (1777).

Type Papilio Eurydice Linn.-Johanss.

Head moderately large; front not very full, protuberant, but not greatly, in the middle beneath, narrower than the eyes, a very little higher than broad; eyes pilose; antennæ composed of 34 or 35 joints, scarcely longer than the abdomen, increasing a little and quite gradually on the apical fourth; palpi slender, barely twice the length of the eye, the apical joint not tufted. Fore tibiæ one-third the length of the hind tibiæ; costal nervure of fore wings greatly swollen at the base; first two branches of the subcostal arising close to the tip of the cell; the latter scarcely less than half as long as the wing; median not enlarged.

The genus Argus was founded by Scopoli upon a motley assemblage of butterflies, agreeing in only a single feature, the presence of ocellate spots on the wings. The name has since been misapplied by Dr. Boisduval to a group of Adolescentes; we accordingly retain it for one of the species mentioned in Scopoli's first section.

† 1. A. **Eurydice** [*Pap. canthus* Linn.; *Hipp. Boisduvalii* Harr.]. This species will undoubtedly be found in Essex County, although there is no record of its capture there; it seems to be local, however, in its distribution, and to be found in damp localities. Lower St. Lawrence to Pennsylvania; westward to Iowa.

MEGISTO Hübn. (1816).

Type Papilio Eurytus Fabr. (1775).

Head pretty large; front moderately full, protuberant, but not prominently so, in the middle beneath, a little narrower than the eyes, about as high as broad; eyes naked; antennæ composed of 42 or 43 joints, increasing a very little and very gradually in size on the apical half; palpi slender, rather more than twice the length of the eye, the apical joint not tufted. Fore tibiæ more than one-third the length of the hind tibiæ; costal nervure of fore wings extraordinarily swollen at the base; first superior branch of the subcostal emitted either a little before (♂) or a little beyond (♀) the origin of the first inferior branch; second superior branch arising beyond the tip of the cell; the latter half (♀) or a little more than half (♂) as long as the wing; median slightly swollen at the base.

* 1. M. Eurytus [*Pap. Eurytris* Fabr. (1793); *Pap. Cymela* Cram.]. The eggs are attached slightly to either side of blades of grass, the smaller blades being apparently preferred; they hatch in about a week. United States, east of the Mississippi River.

2. M. Phocion [*Pap. Phocion* Fabr.; *Pap. areolatus* Sm.-Abb.; *Oreas fimbr. Helicta* Hübn.]. I have not been able to examine this species with sufficient care to be sure that it appertains to this genus. Southern states, north to New Jersey.

Subfamily TRIBUNI Herbst (1793).

[Danaidæ Doubl. 1847.]

DANAUS Latr. (1809).

Type Papilio Plexippus Linn.

Head large; front moderately full, broadly and not greatly protuberant in the middle beneath, of about the breadth of the eyes, broader than high; eyes naked; antennæ scarcely as long as the abdomen, composed of 43 or 44 joints, the last 10 or 11 forming a club which increases slowly in size, and has a bluntly rounded apex; palpi stout, fully half as long again as the eye. Fore tibiæ about (♂) or fully (♀) half as long as the hind tibiæ; second superior branch of the subcostal nervure of fore wings originating directly opposite that of the first inferior branch; cell somewhat more than half as long as the wings, longest in the ♀.

* 1. D. Plexippus [*Pap. Archippus* Sm.-Abb.]. This butterfly undoubtedly passes the winter in the perfect state, laying its eggs much later than any other of our hibernating butterflies; there is probably but a single brood each year, the imago being very long lived. North America, south of the southern parts of the British Possessions.

Subfamily NAJADES Borkh. (1788) Enlarged.

[NYMPHALIDÆ Swains. (1827) restr.]

Tribe ARCHONTES Herbst (1793).

[NYMPHALIDI Steph. 1850, pars.; LIMENITIDES Butl. 1869.]

BASILARCHIA nov. gen.

[CALLIANIRA Hübn. 1816.] *Type* PAPILIO ASTYANAX Fabr.

Head large; front moderately full, considerably protuberant in the middle below, narrower than the eyes, distinctly broader than high; eyes naked; antennæ nearly half as long again as the abdomen, consisting of from 40 to 43 joints, the last 14 or 15 gradually expanding into a nearly uniform club, its extreme tip slightly produced; palpi compact, moderately stout, about half as long again as the eye. Fore tibiæ scarcely half the length of the hind tibiæ; first superior branch of the subcostal nervure of fore wings emitted beyond the middle of the outer half of the upper margin of the cell; the second shortly before the tip of the cell; cell a little more than one-third the length of the wing.

This genus is distinct from Limenitis of Europe.

* 1. B. DISIPPE [*Nymph. Disippe* God.; *Pap. Archippus* Cram.; *Pap. Misippus* Fabr.]. The caterpillar feeds on trees so different as willow, poplar, apple, and oak; it has a curious habit, when disturbed, of moving its head in a broad circle from one side to the other, slowly yet not continuously, but in a series of spasmodic starts. Eastern and central United States and Canada.

* 2. B. ASTYANAX [*Pap. Astyanax* Fabr.; *Pap. Ursula* Fabr.; *Pap. Ephestion* Stoll; *Lim. Proserpina* Edw.]. The caterpillar lives upon the upper side of leaves, and devours the whole of one before it deserts it; like its congeners, it assumes, after eating, a very peculiar posture, arching the front part of the body strongly, so that the front of the head touches the ground. Canada to Florida, westward to Iowa.

† 3. B. ARTHEMIS [*Pap. Arthemis* Drur.; *Pap. Lamina* Fabr.]. This fine insect is occasionally taken even so far south as the immediate vicinity of Boston; and will therefore undoubtedly be found in the higher portions of Essex County, though I have not yet heard of its capture there. Canada and northern limits of United States.

Tribe PHALERATI Hübn. (1805).

[NYMPHALIDI Steph. 1850, pars; APATURÆ Butl. 1869.]

DOXOCOPA Hübn. (1816).

Type PAPILIO AGATHINA Cramer.

Head large; front pretty uniformly tumid, slightly fuller beneath, a little narrower than the eyes, as broad as high; eyes naked; antennæ nearly twice as long as the abdomen, composed of 46 joints, the terminal fourteen of which expand very gradually into a cylindrical club, the tip bluntly rounded; palpi of moderate size and stoutness, scarcely half as long again as the eye. Fore tibiæ less than half the length of the hind tibiæ; fore tarsi fully (♂) or but little more than half (♀) as long as the fore tibiæ; middle and hind tibiæ of equal length; first superior branch of the subcostal nervure of fore wings arising a short distance before the extremity of the upper border of the cell; second branch arising an equal distance beyond the extremity of the cell; the latter open.

1. D. LYCAON [*Pap. Lycaon* Fabr.; *Apat. celtis* Boisd.-LeC.; *Apat. Alicia* Edw.]. Southern states.
2. D. HERSE [*Pap. Herse* Fabr.; *Apat. Clyton* Boisd.-LeC.; *Apat. Proserpina* Scudd.]. Southern and western states; occasionally as far as New York.

Tribe PRÆFECTI Herbst (1793).

[VANESSIDI Steph. 1850; VANESSIDES Butl. 1869.]

POLYGONIA Hübn. (1816).

[GRAPTA Kirb. (1837).] *Type* PAPILIO C-AUREUM Linn.

Head of moderate size; front moderately swollen, slightly fuller beneath, broader than high, very little broader than the eyes; eyes pilose, with pretty long hairs; antennæ nearly twice as long as the abdomen, composed of about 41 joints, the last eleven of which form an elongated somewhat ovate club, the tip very bluntly conical; palpi pretty stout, nearly three times as long as the eye. Fore tibiæ fully half as long as the hind tibiæ, especially in the female; middle tibiæ slightly longer than the hinder pair; first superior branch of the subcostal nervure of the fore wings emitted a little beyond the middle of the outer two-thirds of the upper margin of the cell; the second about midway between the origin of the first branch and the tip of the cell; cell nearly half as long as the wing.

* 1. P. INTERROGATIONIS [*Pap. interrogationis* Fabr.; *Grapta umbrosa* Lintn.; *Grapta Fabricii* Edw.]. Toward the north the darker form *seems* to be less abundant than the lighter. Is the contrary true toward the south? Mr. Edwards' experiments leave nothing to be desired in proving the identity of what were formerly considered two species. Eastern and central United States.

2. P. CRAMERII [*Grapta Crameri* Scudd.]. Southern states.

* 3. P. COMMA [*Van. comma* Harr.]. The caterpillar eats the leaves upon which it feeds in deep gashes; the chrysalis state lasts from ten to fifteen days. Eastern and central states as far south as Kentucky and Western Virginia.

† 4. P. DRYAS [*Grapta Dryas* Edw.]. Is it distinct from the previous? I am strongly inclined to the opinion that it bears the same relation to *P. comma* that the two forms of *P. interrogationis* do to each other. Same range as the preceding?

5. P. FAUNUS [*Grapta Faunus* Edw.]. Canada and northern parts of northern United States.

6. P. GRACILIS [*Grapta gracilis* Grote-Rob.]. Mountainous parts of northern New England.

* 7. P. PROGNE [*Pap. Progne* Cram.; *Grapta c-argenteum* Kirb.]. The eggs are laid singly on the upper surface of currant and gooseberry leaves; they hatch in a little more than four days; the longitudinal ribs are ten in number. Northern and eastern United States and Canada.

NYMPHALIS Latr. (1805).

Type PAPILIO POLYCHLORUS Linn.

Head pretty large; front very moderately and pretty uniformly swollen, being scarcely fuller beneath, broader than high, scarcely so broad as the eyes; eyes pilose, with short hairs; antennæ half as long again as the abdomen, composed of about 44 joints, the last twelve of which form a very oblong, ovate, cylindrical club, the extremity very bluntly conical; palpi stout, about two and a half times longer than the eye. Fore tibiæ three-fifths the length of the hind tibiæ; fore tarsi about three-fifths the length of the fore tibiæ; middle tibiæ scarcely as long as the hinder ones; first superior branch of the fore wings emitted a little beyond the middle of the outer two-thirds of the upper margin of the cell; the second a little more than half way from the origin of the first to the tip of the cell; cell considerably less than half as long as the wing.

This generic name has often been applied, but incorrectly, to some of the Archontes. It is properly referred by Kirby in the Appendix to his Catalogue of Diurnal Lepidoptera; but since the group, as circumscribed in that work, is composed of many members, we have restricted it, considering as the type a species which was included in it by all the older writers who employed the generic name.

† 1. N. J-ALBUM [*Van. J-album* Boisd.-LeC.]. There can hardly be a doubt that this butterfly is a constant inhabitant of Essex County, but I have seen no specimen from there. The head of the larva resembles that of Polygonia as Mr. Lintner has pointed out. Northern United States and Canada.

PAPILIO Linn. (1758).

Type PAPILIO ANTIOPA Linn.

Head pretty large, densely clothed with a bushy mass of long and short hairs. Front well rounded, tumid, protuberant beneath, broader than high, of just the breadth of the eyes; upper edge bluntly rounded and protuberant in the middle, falling rather abruptly into the transverse pit of the antennæ; lower edge broadly rounded, almost docked. Vertex moderate, very tumid, projecting very considerably and throughout its whole length above the level of the eyes, very broadly rounded behind, in front projecting with curved sides deeply and rather sharply into the space between the antennæ, where it is deeply sunken and connected with the front by a narrow bridge. Eyes pretty large, full, sparsely pilose with pretty nearly uniform long hairs. Antennæ inserted very slightly indeed in advance of the middle of the summit in deep, nearly connected pits, their interior bases separated by a space equal to the width of the antennal stalk, and their exterior closely crowded upon the margin of the eyes; they are about half as long again as the abdomen, consisting of 44 or 45 joints, the last eleven or twelve of which form a very oblong, ovate, cylindrical club, about two and a half times as broad as the stalk, four and a half times as long as broad, the extremity very bluntly conical, the last three or four joints entering into the diminution of size, and successively turned a little more outward, so that the outer edge of the club is nearly straight to the tip, while the inner is broadly rounded, terminal joint minute; furnished along the under portion of the inner side with a delicate triple carina, continuing indistinctly over a portion of the stalk. Palpi moderately stout, fully three times as long as the eye, compressed, curved outward above, the terminal joint two and a half times shorter than the penultimate, the whole furnished sparsely above and beneath with very long, bristly hairs, directed in a vertical plane and heavily clothed with somewhat erect scales.

Prothoracic lobes pretty large, not very tumid, anteriorly appressed, posteriorly broadly rounded, tapering a little exteriorly, but scarcely at all interiorly, four times as broad as long, considerably higher than long.

Paraptera scarcely twice as long as broad, gently tumid, very broad and nearly square at base, the outer border straight, the inner rather deeply concave, so that the posterior lobe narrows rapidly at first and then tapers gradually to a rounded point, the posterior portion being, as it were, triangular with the outer hinder angle greatly produced; the interior border is roundly, rather broadly ridged.

Fore wings a very little more than half as long again as broad, the costal margin considerably bent at a short distance from the base, beyond, nearly to the apex, almost straight, very slightly convex, the apical part curved somewhat backward; the outer border is a very little crenulate, its upper portion, as far as the middle of the lower subcostal interspace, slightly concave, having a general direction at right angles to the middle of the costal margin; below this to the middle of the succeeding interspace suddenly receding and then passing in a nearly straight course, broken by the crenulations, and by a little, broad, rounded projection, just below the lower median nervule, to the well rounded lower angle; inner margin very nearly straight. First superior branch of the subcostal nervure emitted in the middle of the outer half of the upper margin of the cell; second, half way from the origin of the first to the tip of the cell — both a little further from the base in the male than in the female; origin of the third midway between the tip of the cell and the base of the fourth, the latter arising at more than three-fifths the distance from the tip of the cell to the apex of the wing; second inferior branch arising scarcely more than one-quarter way down the cell; the latter two-fifths as long as the wing and about three times as long as broad; the distance from the origin of the second median nervule to the vein closing the cell is half that to the base of the first median nervule. Hind wings with the costal margin somewhat bowed, rather more strongly on the basal than on the apical half, the outer margin rather broadly rounded, projecting at the tip of the upper median nervule into a moderate rounded tail, tapering at the base, longer than broad, and with a slight, rounded projection at the tip of the lower median nervule;

inner border broadly expanded at the base, beyond straight nearly two-thirds of the way to the tip, then receding suddenly but a little diagonally to a great distance, it resumes its former direction, and with a slight convexity passes to the abrupt, but well-rounded anal angle. Precostal nervure bent inwards, originating considerably beyond the divarication of the subcostal from the costal nervure; cell closed by a feeble vein.

Fore legs small, cylindrical, a little depressed, thickly clothed with a depressed bushy bunch of long somewhat spreading hairs, heavier in the male than in the female; the tibia slightly less than half as long as the hind tibia; tarsi of nearly or quite the length of the tibia, in the male, consisting of a single joint, with exceedingly slight indications of divisions — one only being marked by a slight constriction near the tip — and wholly unarmed; in the female, distinctly composed of four joints, of which the first is two and a half times as long as the others taken together, and these successively smaller toward the tip, each joint furnished beneath with a pair of very short, slender spines. Middle tibiæ scarcely longer than the hind ones, furnished on either side beneath and on the upper portion of the inner side with a row of not very frequent, long and moderately stout spreading spines, besides a few shorter scattered ones along the outer side, the terminal ones of the inferior rows developed into moderately long and slender spurs; tarsi with the first joint as long as the three succeeding ones together, the second and fifth equal, the third and fourth scarcely smaller, equal to each other; furnished with four (the last joint with two) rows of rather short and moderately stout spines beneath, and a few scattered ones above at the base of the first joint. Claws moderately slender, not large, tapering to a fine point, pretty strongly curved. Paronychia slender, tapering a little, as long as the claws, but curving less, though regularly, finely pointed, a little incurved at tip. Pulvillus wanting. Last joint of tarsi furnished above with four excessively fine, long aciculate spines, directed between the claws.

LARVA. — Head not very large, subquadrate on a front view, the sides being very broadly rounded, almost flat, the summit hollowed a little at the middle suture, the apices of each half a little tumid; it is a little full about the ocellar field, broadly appressed in front, the triangle scarcely sunken, the head hardly deeper below than above, covered all over, but especially on the tumid summits and the hinder portions, with a large number of short, stout, conical, blunt tubercles, and more frequent minute ones, the latter emitting each a short hair; triangle more than half as high again as broad, the sides slightly curved, scarcely extending more than half way to the summit. Antennæ with the basal joint scarcely exserted, the second half as long as broad, stout, the third half the diameter of the second, fully thrice as long as broad, the fourth very small. Ocelli six in number, five arranged in a moderately broad curve, its convexity forward, the middle three at equal and very slight distances from each other, the first removed from the second, and the fifth from the fourth by their own diameter; the sixth is situated at a little distance behind at equal distances from the first and fourth, with which it forms a right angle; all equal in diameter, the second to the fifth very protuberant. Labrum very small, deeply excised in the middle. Mandibles moderately large, stout, angulated, the edge straight, entire, above with some scarcely impressed lines. Labial palpi exceedingly small, not at all exserted. Spinneret small, conical, tapering.

Body cylindrical, nearly equal on the abdominal segments, the thoracic segments tapering somewhat forwards, armed with quite long, stout spines, each one tapering regularly to a fine point, and bearing a few minute, short, needle-like thorns, scarcely visible to the naked eye, and often, generally above the middle, one, two, or three little short spinules, tipped with a short thorn; these spines are arranged in longitudinal rows, one to a segment in each row as follows: a dorsal series, placed anteriorly on the third to the eighth abdominal segments; a latero-dorsal series, placed a little in advance of the centre of the first to the eighth abdominal segments; a supralateral series, placed similarly on the second and third thoracic segments; those of the last two series are somewhat larger than the others; a latero-stigmatal series, placed similarly on all the abdominal segments; a stigmatal series, placed centrally on the second and third thoracic segments; and an infrastigmatal series, placed centrally on the first to the eighth abdominal segments. The body is abundantly supplied with minute warts, and profusely furnished with still minuter ones; the former emit short delicate hairs, and on the posterior parts of the segments are arranged in transverse rows. Spiracles small, obovate, less than twice as broad as long. Legs rather slender, tapering, the posterior pair long, the others rather short, the last joint compressed; the claw small, a little curved, compressed, heavily heeled at the base. Prolegs long, rather stout, tapering considerably, with a multitude of hooklets, closely crowded in more than a single row around the inner two-thirds of an oval, the hooklets slender, nearly equal, not curving greatly.

PUPA.—Viewed from above the head and prothorax taper very slightly as far as the base of the ocellar tubercles, the outer edges of which are parallel; ocellar prominences conical, their inner edges inclined toward each other at a little more than a right angle, the space between them squarely docked; on a side view, the under edge is continuous, or nearly so, with the under surface of the appendages, slightly curved downward at tip; the upper edge is continuous with that of the prothorax, forming an angle of about fifty degrees with the lower edge. The mesonotum is greatly arched longitudinally and carinated along the middle line, the carina rapidly and regularly elevated just behind the middle to a great height, forming a projection which is highest posteriorly, half as high as long, with sloping sides placed at an angle of about thirty-five degrees with each other, and posteriorly falling almost perpendicularly to the general curve of the segment. Inferior surface of body, including all the appendages forming an almost exactly straight line from the tip of the ocellar prominences to near the tip of the wings, where it slopes upward. The middle of the mesonotum is also furnished with a pair of small supralateral rounded conical warts, as high as broad; basal wing tubercle and supernumerary tubercle much as in Polygonia, separated by a rather deep, somewhat angular excision; wings protuberant in the middle of the upper half of the posterior border and elevated into a blunt, conical tubercle, making the body here as broad as at the supernumerary tubercle; metanotum with supralateral tubercles similar to those of the mesothorax. Abdomen shaped as in Polygonia, furnished with a dorsal series of low, small, conical warts on the anterior edges of the third to the eighth segments; a series of greatly elevated conical tubercles, the tips of each produced to a sharp, hard point, each perpendicular to the surface on which it rests, arranged in a latero-dorsal line on the centre of the second to the eighth segments, that of the third segment considerably larger than the others, directed slightly backward, that of the eighth diminutive, scarcely produced at tip; the first segment has a pair of small, rounded latero-dorsal warts, placed anteriorly; there is also a series of small, low, rounded, suprastigmatal warts, placed a little in advance of the middle of the second to the ninth segments; and an infrastigmatal series of similar warts in the middle of the fifth to the eighth segments. Preanal button bounded by a low, coarse, corrugated, equal, slightly curving, longitudinal wall, terminating anteriorly in a stout, irregular, subspherical tubercle; anal button posterior to it deeply hollowed; it is corrugated throughout, above hollowed broadly but shallowly, the bounding wall very thick at base, slender beyond; on a dorsal aspect it is considerably longer than broad, tapering somewhat to a well-arched tip; viewed at the side it is nearly equal, a little broader at the base, the apical field of hooklets circular and small. Hooklets long, slender, and straight, until close to the tip, where they are each rather suddenly and considerably enlarged into a strongly curving club, the end produced to a blunt tip, directed toward the base.

The generic name Papilio was applied by Linné to all the butterflies, at the foundation of the binomial system of nomenclature. Fabricius, in his later works restricted it to the Nymphales and Papilionides, applying the name Hesperia to the Rurales and Urbicolæ. Schrank was the next author to restrict the name, limiting it, in 1801, to most of the Nymphales. If the laws of priority have any force or meaning, I do not see how we can refuse to acknowledge the claims of Schrank, even if, as in this case, they conflict with (so far as I know) the *unanimous* usage of subsequent authorities. I select, accordingly, from among the species grouped under Papilio by Linné, Fabricius, and Schrank, one of the best known European butterflies as most suitable to serve as the type of the genus. If this action should hasten the disintegration of the genus Papilio of modern authors, and thus lead to an earlier comprehension of the relationship of the heterogeneous forms now amassed under that much abused name, the result would be at least satisfactory.

* 1. P. ANTIOPA [*Van. Antiopa* Auct.]. The eggs are laid in little clusters encircling, or partially encircling, the terminal twigs of willow and elm trees, each egg in contact with those around it; the caterpillars feed in company throughout life; the chrysalis occasionally winters, but hibernation is usually restricted to the butterfly, which lays its eggs in the spring. Northern United States and Canada from the Atlantic to the Pacific.

AGLAIS Dalm. (1816).

Type PAPILIO URTICÆ Linn.

Head moderately large, rather densely clothed with long and short erect hairs. Front very moderately swollen, scarcely fuller beneath, as broad as high, scarcely as broad as the eyes; upper edge rather broadly rounded and protuberant in the middle, where it falls rather abruptly and nearly as much as at the sides; lower edge well rounded. Vertex rather small, partly tumid, but posteriorly projecting beyond the height of the eyes only a very little, broadly rounded behind, in front advancing with curved sides deeply and sharply into the space between the antennæ, where it is greatly sunken and connected with the front by a narrow bridge. Eyes not very large, pretty full, sparsely pilose with long hairs, longest in front in the middle of the upper half. Antennæ inserted deeply in the middle of the summit in nearly connected pits, their interior bases separated by the width of the antennal stalk, and on their exterior bases closely crowded to the margin of the eyes; nearly half as long again as the abdomen, consisting of from 35 to 36 joints, the last nine or ten of which expand gradually into an oblong-ovate, depressed club, about four times as broad as the stalk, four times as long as broad, the extremity broadly rounded, three joints entering into the diminution of size, but the last disturbing the uniformity by being very bluntly conical, depressed; club furnished along the under portion of the inner side with a slight triple carina which continues indistinctly along the greater portion of the stalk. Palpi stout, scarcely three times as long as the eye, compressed, curved slightly, the terminal joint one-third the length of the penultimate, the whole furnished with fine longer and coarse shorter hairs, most conspicuous on the penultimate joint and restricted generally, and especially above, to a vertical plane, adding to its compressed appearance.

Prothoracic lobes moderately large, scarcely arched, not very tumid, the anterior border straight, the posterior and superior slightly curved, well rounded and tapering nearly equally at either end, about five times as broad as long and slightly higher than broad. Paraptera about twice as long as broad, very slightly tumid, very broad, well rounded and nearly circular at base, the posterior lobe projecting as a straight, narrow, greatly tapering blade, the tip curved slightly downward and bluntly pointed.

Fore wings rather more than half as long again as broad, the costal margin bent roundly just beyond the base, beyond it straight nearly to the tip, which is curved downward a little; outer margin slightly crenulate, the upper portion, above the middle of the lower subcostal interspace, a very little concave and having a general direction at a little less than a right angle with the middle of the costal margin; behind this suddenly receding to the middle of the succeeding interspace, and then passing in a slight, broad, concave swell to just below the lower median nervule, where it is again slightly angulated; the inner border is straight, the angle broadly rounded. First superior branch of the subcostal nervure emitted a little beyond the middle of the outer half of the upper margin of the cell; second half way between the base of the first and the tip of the cell; both a little further from the base in the male than in the female; third rather less than one-third, fourth a little more than one-half the distance from the tip of the cell to the apex of the wing; second inferior branch of the subcostal nervure arising from one-fourth to one-third way down the cell; the latter considerably less than half as long as the wing, and less than three times as long as broad; the distance from the origin of the second median nervule to the vein closing the cell is one-half that between the bases of the first and second nervules. Hind wings with the costal border scarcely convex, the outer border delicately crenulate, rather broadly curved, protuberant as a slight angular dentation at the tip of the upper median nervule; the inner border scarcely convex for nearly two-thirds its distance beyond the basal expansion, then roundly excised for a short distance, it continues its direction nearly parallel to the former portion, the outer angle abrupt but rounded. Precostal nervure directed straight upward, not inclined in either direction, originating considerably beyond the divarication of the subcostal from the costal nervure. Cell closed by a feeble vein.

Fore legs small, cylindrical, a little depressed, clothed with a depressed, bushy bunch of long spreading hairs, rather heavier in the male than in the female; the tibia about half the length of the hind tibia; tarsi scarcely shorter than the tibia in the male consisting of a single joint, with exceedingly slight indications of any divisions and wholly unarmed; in the female distinctly composed of four joints, of which the first is twice as long as all the others united, and these successively shorter, each armed beneath at its tip with a pair of minute slender spines. Middle and hind tibiæ of equal length, furnished on either side beneath and on the upper portion of the inner side with a row of infrequent, long and pretty slender, slightly spreading spines, the terminal ones of the inferior rows prolonged to long and very slender spurs; tarsi having the first joint nearly as long as the others taken together, the second, third, and fourth successively decreasing in size, the fourth half as long as, and the fifth a little longer than, the second; joints furnished beneath with four, the last with only two, rows of small and slender spines, the terminal ones on each joint scarcely longer than the others. Claws delicate, not very long, tapering to a fine point, pretty strongly curved. Paronychia slender, tapering, nearly as long as the claws, curving less and nearly straight on the apical half. Pulvillus wanting; last joint of tarsi furnished above at the tip with four very minute and slender, but pretty long, slightly diverging, aciculate spines, directed between the claws.

Larva.—Head not very large, pretty well rounded, the sides broadly rounded, broadest in the middle; the summit of either half pretty broadly rounded, very slightly elevated, the suture between a very little depressed; the whole front is subappressed, hardly deeper below than above, covered with pretty frequent, small and minute, short conical tubercles, all the latter, and some of the former emitting pretty long hairs; triangle fully half as high again as broad, extending fully half way to the summit. Antennæ with the second joint not half as long as broad, the third three-quarters the diameter of the second and half as long again as broad, cylindrical, squarely docked, emitting a moderately long hair; fourth joint not noticeable. Ocelli as in Papilio. Labrum small, half as broad again as long, well rounded, pretty deeply excised in the middle. Mandibles very small, moderately stout, the edge straight, coarsely and slightly denticulate. Labial palpi small; first and second joints of nearly equal diameter; third slightly smaller, fully half as long again as broad, rounded at apex; fourth minute, knob-like. Spinneret rather long, slender, curved, tapering.

Body cylindrical, largest in the middle of the abdomen, tapering more anteriorly than posteriorly, armed with pretty long, moderately stout spines, each one tapering regularly, docked at the tip, and bearing a bristle-like thorn, scarcely smaller than a continuation of the spine would have been, finely pointed and about one-third the length of the spine itself; these spines each bear numerous larger and smaller cylindrical tubercles, from the larger of which, generally three or four in number, arise long acicular thorns, longer than the apical thorn of the spine, and divergent at an angle from the spine; from the smaller ones, which are much more numerous, shorter and much more delicate needles take their rise. The spines are arranged in longitudinal rows, one to a segment in each row, as follows: a dorsal series, inserted anteriorly on the second to the eighth abdominal segments; a latero-dorsal series, placed a little in advance of the centre, directly over the spiracles, on the first to the eighth abdominal segments; a supralateral series, placed centrally on the second and third thoracic segments; the spines of the last two series are slightly longer than the others; a latero-stigmatal series, placed similarly to the row above, on all the abdominal segments; a suprastigmatal series, placed centrally, on the second and third thoracic segments; and an infrastigmatal series, placed centrally, on the first to the eighth abdominal segments. The body is supplied pretty abundantly with minute conical warts, some exceedingly minute, emitting each a hair, proportioned in length to the size of the wart, the largest more than half as long as the spines, and on the posterior parts of the segments arranged in transverse rows; the smaller ones with no regularity of disposition; first segment with a transverse anterior series of the largest ones. Spiracles rather small obovate, nearly twice as broad as long. Legs and prolegs as in Papilio.

PUPA.—Viewed from above the prothorax and head scarcely taper to the tips of the ocellar projections, which are conical, bluntly pointed and have their inner edges inclined at a right angle to each other, the space between them squarely docked; on a side view they are directed straight forward, a little protuberant at base, their lower edge considerably inclined to the under surface of the chrysalis, their upper nearly continuous with the line of the prothorax. The mesonotum is considerably arched longitudinally, carinate slightly along the median line; on the anterior half just beyond the middle, elevated to an anteriorly compressed, triquetral, pyramidal tubercle, not very large, not so high as long, scarcely pointed. Inferior surface, including the appendages, straight from the base of the ocellar prominences to near the tips of the wings. Meso- and metanotum furnished with a median supralateral pair of rather small, rounded, elevated warts, higher than broad; wing tubercle of a similar form, with a short ridge running from its base toward, and away from, the supralateral tubercles of the mesonotum, and a larger one, connecting it with the supernumerary wing tubercle; the latter is little more than an elevation of this ridge to the height of the basal wing tubercle, from which it is separated by an angular, but not deep excision. Wings protuberant in the middle of the upper half of the posterior border, but not elevated to a tubercle. Abdomen less arched than in Polygonia, furnished with a dorsal series of small, low, inconspicuous warts on the anterior edge of the second to the eighth segments; a latero-dorsal series of bluntly conical tubercles on the middle of the first to the eighth segments, similar to those on the sides of the thoracic segments, but somewhat larger, especially on the fourth segment, and excepting on the first and eighth where they are smaller; a suprastigmatal series of low, inconspicuous warts a little in advance of the middle of the third to the seventh segments; and an infrastigmatal series of similar warts on the middle of the fifth to the eighth segments. Preanal button quite similar to that of Papilio, the bounding ridges very heavy. Anal button, viewed from above nearly half as long again as broad, scarcely tapering, the bounding walls low, broad, equal; viewed from the side slightly tapering, considerably enlarged at the tip. Hooklets rather short, not much enlarged at the tip, which is bent roundly at right angles, and has a scarcely produced, short, downward directed apex.

The generic name *Aglais*, applied by Dalman to all the Præfecti of Sweden, has been entirely neglected up to this day; and since the group herein defined for the first time, contains one European representative included by Dalman in Aglais, we apply the name here.

† 1. A. MILBERTII [*Van. Milberti* God.; *Van. furcillata* Say]. The eggs are laid in clusters on some of the terminal leaves of the nettle; the caterpillars feed in close company during the earlier stages but subsequently scatter. Will probably be found in the higher parts of Essex County; abundant in Canada and adjacent parts of the United States.

VANESSA Fabr. (1807).

Type PAPILIO ATALANTA Linn.

Head large; front moderately full, slightly protuberant in the middle or just below it, as broad or slightly narrower than the eyes, slightly broader than high; eyes scarcely pilose with short hairs; antennæ more than half as long again as the abdomen, consisting of from 39 to 41 joints, the last eleven developing into a spatulate club, the last joint forming a minute, conical, pointed tip, but otherwise broadly rounded; palpi compact, stout, two and a half times longer than the eye. Fore tibiæ about half as long as the hind tibiæ; fore tarsi three-fifths the length of the fore tibiæ; middle tibiæ slightly longer than the hind pair; first superior branch of the subcostal nervure of the fore wings emitted a little beyond the middle of the outer two-fifths of the upper margin of the cell; the second half way between the origin of the first and the tip of the cell; cell two-fifths the length of the wing.

Hübner was the first to restrict the Fabrician genus *Vanessa* within narrower limits — as here circumscribed; Hübner's genus *Pyrameis* is synonymous, and must be dropped.

* 1. V. ATALANTA. When one of the caterpillars, concealed in its leafy enclosure, is disturbed, it signifies its disapproval by running from one part of its house to another, shaking its head violently so as to strike the sides of the leaf; it thus en-

deavors to jolt off the intruder, and the blows effect an appreciable jarring of the leaves. Europe and America.

* 2. V. HUNTERA [*Pap. Huntera* Fabr.; *Pyr. Virginiensis* Kirb.]. The caterpillars pick to pieces, as it were, the blossoms of "Everlasting" until it is like cotton, and with a slight web make a nest of it; this gives the plant a rounded top, instead of the flat summit naturally exhibited, and by this they can be more readily discovered. Canada to Mexico.

* 3. V. CARDUI [*Pap. Cardui* Linn.; *Pap. carduelis* Cram.]. In Egypt the caterpillar feeds on a species of mallow, entirely neglecting the thistles which skirt the railways abundantly; the caterpillar may be found the winter through. The World.

JUNONIA Hübn. (1816).

Type PAPILIO LAVINIA Cramer.

Head pretty large; front moderately full, a very little protuberant in the middle below, narrower than the eyes, broader than high; eyes naked; antennæ about half as long again as the abdomen, composed of about 35 joints, the terminal nine or ten expanding into a broad, ovate, depressed club; palpi compact and pretty stout, scarcely more than half as long again as the eye. Fore tibiæ less than half the length of the hind tibiæ; fore tarsi about three-fifths the length of the tibiæ; middle tibiæ very slightly longer than the hind pair; first superior branch of the subcostal nervure of the fore wings emitted a little beyond the middle of the outer two-fifths of the upper margin of the cell; the second half way between the origin of the first and the tip of the cell; cell open.

† 1. J. CŒNIA [*Pap. Orythia* Sm.-Abb.; *Junonia Cœnia* Hübn.]. This southern species has been taken in a single instance on the sea-coast of New Hampshire, almost within sight of Essex County, so that it may be added to the list of probable discoveries.

Tribe DRYADES Borkh. (1788).

[ARGYNNIDI Steph. 1850, pars; ARGYNNIDES Butl. 1869, pars.]

EUPTOIETA Doubl. (1848).

Type PAPILIO CLAUDIA Cram.

Head large; front moderately and pretty uniformly full; eyes naked; antennæ considerably longer than the abdomen, composed of 43 joints, of which the last ten or eleven form an ovate or subspatulate club, the apex broadly rounded and with a slight, conical tip; palpi pretty large and stout, scarcely twice as long as the eye. Fore tibiæ less (♂) or more (♀) than half as long as the hind tibiæ; fore tarsi a little less (♂) or more (♀) than three-quarters the length of the tibiæ; middle tibiæ slightly longer than the hind pair; first superior branch of the subcostal nervure of the fore wings arising but shortly before the tip of the upper margin of the cell; the second arising as far beyond the upper limit of the cell as the fourth from the outer border of the wing; cell but little more than one-third the length of the wing.

1. E. CLAUDIA [*Pap. Clausius* Herbst; *Arg. Columbina* God.]. Southern states as far north as Long Island.

SPEYERIA nov. gen.

Type PAPILIO IDALIA Drury.

Head quite large; front pretty full, most so a little below the middle, broader than high, but not nearly as broad as the eye; eyes naked; antennæ a little longer than the abdomen, composed of 52 joints, the last thirteen of which form a suboval club, the extremity rather broadly rounded, with a minute, conical apex; palpi not very large nor stout, scarcely half as long again as the eye. Fore tibiæ scarcely more than one-third as long as the hind tibiæ; the tarsi scarcely shorter than the tibiæ; middle tibiæ a little shorter than the hind pair; first superior branch of subcostal nervure of fore wings emitted beyond the middle of the outer half of the upper margin of the cell; cell two-fifths the length of the wing

We dedicate this genus to Dr. A. Speyer, who laid the foundation of our knowledge of the minuter structure of the jointed appendages of butterflies, and to whom we owe a most careful study of the geographical distribution of the Lepidoptera of Central Europe.

† 1. S. IDALIA. As I have received notices of the capture of this largest of our fritillaries on all sides of Essex County, it will probably be found there also, but sparingly. Maine to Pennsylvania, and westward to Iowa.

ARGYNNIS Fabr. (1807).

Type Papilio Aglaia Linnæus.

Head pretty large; front pretty full, considerably protuberant in the middle below, broader than high, but not so broad as the eyes; eyes naked; antennæ considerably longer than the abdomen, composed of from 41–49 joints, the last eleven to thirteen of which form an ovate club, the extremity of which is well rounded, with a minute, conical tip; palpi pretty long, not stout, nearly or quite twice as long as the eyes. Fore tibiæ two-fifths (♂) or little more than two-fifths (♀) the length of the hind tibiæ; fore tarsi a little more than three-fourths the length of the fore tibiæ; middle tibiæ a little shorter than the hind pair; first superior branch of the subcostal nervure of fore wings arising in the middle of the outer two-fifths of the upper border of the cell; the second half way between that and the apex of the cell; cell considerably less than half as long as the wing.

* 1. A. Cybele [*Pap. Cybele* Fabr.; *Pap. Daphnis* Cram.]. All the caterpillars raised by Mr. Edwards and myself from eggs of this species laid in the autumn, refused to eat, even when placed upon growing violets; the eggs are laid upon the leaves and stalks of this plant. Southern and Middle New England to Virginia and Missouri.

* 2. A. Aphrodite [*Pap. Aphrodite* Fabr.]. The young caterpillars of this species and its congeners are furnished on each segment with eight very long, spiculiferous hairs, half as long as the body. Canada to Tennessee.

3. A. Atlantis Edw. Canada and adjacent parts of northern states as far west as Minnesota and Lake Winnipeg.

BRENTHIS Hübn. (1816).

Type Papilio Hecate Wien. Verz.

Head large; front moderately full, most so in the middle, much broader than high, just above the middle as broad as the eyes; eyes naked; antennæ a little longer than the abdomen, consisting of from 33 to 34 joints of which the last ten form a broad, ovate club, the extremity of which is broadly rounded, with a minute conical tip; palpi very long and pretty slender, barely twice as long as the eye. Fore tibiæ scarcely (♂) or fully (♀) half the length of the hind tibiæ; middle tibiæ scarcely shorter than the hind pair; first superior branch of subcostal nervure of fore wings arising shortly before the apex of the cell; the second at a similar distance beyond it; cell nearly half as long as the wing.

* 1. B. Myrina [*Pap. Myrina* Cram.; *Arg. Myrissa* God.]. The same difficulty attends rearing the autumn brood of caterpillars of this species, as was experienced with *Arg. Cybele*; those hatching in July were raised without trouble, while no persuasion of fresh food or living plants would induce a single one of the September caterpillars, by night or day, to partake of food; they all hatched and they all died. From North Carolina to Hudson's Bay; and from the Atlantic to the Mississippi.

2. B. Montinus [*Arg. Montinus* Scudd.]. White Mountains and adjacent region.

* 3. B. Bellona [*Pap. Bellona* Fabr.]. The eggs of this species hatch, sometimes in five, sometimes not for ten days; the caterpillar eats a small hole in the upper half of the side of the egg to make its escape; sometimes they afterwards devoured the rest of the egg-shell, as is very frequently the case with other Lepidoptera. From Virginia to Hudson's Bay, and from the Atlantic westward to Iowa.

Tribe HAMADRYADES Borkh. (1788).

[Argynnidi Steph., 1850, pars; Argynnides Butl., 1869, pars.]

PHYCIODES Hübn. (1816).

Type Papilio Cocyta Cram.

Head large; front scarcely at all inflated, excepting in the middle beneath, where it is rather sharply protuberant, scarcely as broad as the eyes, nearly half as broad again as high; eyes naked; antennæ considerably longer than the abdomen, composed of 34 or 35 joints, of which the last eleven or twelve form a compressed cylindrical club, the end well rounded, the apex slightly conical; palpi very long and not very stout, almost three times longer than the eye. Fore tibiæ about two-fifths the length of the hind tibiæ; fore tarsi scarcely more than one-fourth (♂) or about five-sixths (♀) as long as the tibia; middle tibiæ scarcely so long as the hind tibiæ; first superior branch of the subcostal nervure of the fore wings arising in the middle of the outer two-fifths of the upper border of the cell; the others at equal distances apart and as far as the second is removed beyond the apex of the cell; cell scarcely two-fifths as long as the wing.

* 1. P. THAROS [*Pap. Tharos* Drury; *Pap. Morpheus* Herbst; *Pap. Euclea* Bergstr.; *Pap. cocyta* Cram.; *Mel. Telenis* Kirb.; *Mel. Marcia* Edw.; *Mel. Packardii* Saund.]. The egg of this species differs remarkably from that of all butterflies known to me, in that the cross section is not circular but elliptic; it is nearly devoid of markings. Canada and northern half of the United States, east of the Rocky Mountains.

2. P. BATESII [*Eres. Batesii* Reak.]. Virginia to New York.

CHARIDRYAS nov. gen.

Type MELITÆA NYCTEIS Doubl.

Head pretty large; front a little tumid, beneath broadly and rather largely protuberant, broader than high, somewhat narrower than the eyes; eyes naked; antennæ considerably longer than the abdomen, composed of from 35 to 37 joints, of which thirteen or fourteen form the cylindrical club, with a bluntly rounded extremity, the tip bluntly conical; palpi very long and moderately stout, more than twice as long as the eye. Fore tibiæ scarcely two-fifths the length of the hind tibiæ; fore tarsi less than (♂) or fully (♀) half as long as the tibiæ; middle tibiæ slightly shorter than the hind pair; first superior branch of the subcostal nervure of fore wings emitted shortly before the apex of the cell; the second as far beyond the apex of the cell as from the origin of the third superior branch; cell fully two-fifths the length of the wing.

† 1. C. NYCTEIS [*Mel. Nycteis* Doubl. nec Edw.; *Mel. Ismeria* Harr. nec Boisd.-LeC.; *Mel. Œnone* Scudd.]. This species has been taken in one or two instances only in Eastern New England, and it is not impossible that it may yet be discovered in Essex County. Northern United States, as far south as Virginia, and west to Iowa.

2. C. ISMERIA [*Mel. Ismeria* Boisd.-LeC.; *Eres. Carlota* Reak.; *Mel. Nycteis* Edw. nec Doubl.]. Western and southern states.

LIMNÆCIA nov. gen.

Type MELITÆA HARRISII Scudd.

Head large; front slightly tumid, scarcely at all protuberant below, not nearly so broad as the eyes, but a little broader than high; eyes naked; antennæ considerably longer than the abdomen, composed of 33 joints, of which the last twelve or thirteen form an oblong, ovate club, well rounded at tip; palpi long and moderately stout, scarcely twice as long as the eye. Fore tibiæ half (♂) or a very little less than half (♀) the length of the hind tibiæ; fore tarsi half as long (♂) or as long (♀) as the fore tibiæ; middle tibiæ scarcely longer than the hind pair; first superior branch of the subcostal nervure of fore wings arising shortly before the apex of the cell; the second at one-fourth the distance from the origin of the first to the outer border; cell about two-fifths the length of the wing.

† 1. L. Harrisii. A local species, to be looked for in swampy localities, where the food of the caterpillar, Diplopappus umbellatus, is to be found. It has been taken near Boston and in Maine, and may therefore be expected to appear in Essex County. Canada and northern United States as far west as Michigan.

EUPHYDRYAS nov. gen.

Type Papilio Phaeton Drury.

Head moderately large; front slightly tumid, very slightly protuberant below, about three-fourths the breadth of the eyes, somewhat broader than long; eyes naked; antennæ considerably longer than the abdomen, composed of 30 or 31 joints, of which ten or eleven form the club, which is broadly rounded; palpi not long and moderately stout, about half as long again as the eye. Fore tibiæ two-fifths the length of the hind tibiæ; fore tarsi four-fifths (♂) or seven-eighths (♀) the length of the fore tibiæ; first superior branch of the subcostal nervure of fore wings arising shortly before the apex of the cell; the second at about the same distance beyond the tip of the cell (♂) or at the apex itself (♀); cell considerably less than half the length of the wing.

* 1. E. Phaeton. The eggs are laid in patches, on the under surface of leaves of Chelone glabra, one solid layer above another; probably all the eggs are laid in a single patch, since they sometimes contain a very large number. Canada and northern United States, as far south as Virginia, and west as Michigan.

Subfamily HYPATI Hübn. (1816).

[LIBYTHIDES Boisd. (1836); LIBYTHEIDES Boisd. (1840); LIBYTHEIDÆ Westw. (1851); LIBYTHÆINÆ Bates (1864).]

LIBYTHEA Fabr. (1807).

Type PAPILIO CARINENTA Cram.

Head of moderate size; front moderately full, scarcely protuberant beneath, not so broad as the eyes, but considerably broader than high; eyes naked; antennæ considerably longer than the abdomen, composed of 42 joints of which the last twelve to sixteen form a very gradually incrassating, elongated, cylindrical club, with a minute, conical tip; palpi excessively long, fully four times as long as the eye. Fore tibiæ less than one-half (♂) or nearly two-thirds (♀) the length of the hind tibiæ; middle tibiæ scarcely so short as the hind pair; first superior branch of the subcostal nervure of the fore wings arising just before the middle of the outer half of the upper margin of the cell; the second a little before the apex of the same; cell half as long as the wing.

Fabricius in founding this genus mentioned two species, the European *Celtis* and the American *carinenta*. The generic name *Hecaerge* was introduced in 1816, whether by Ochsenheimer or by Hübner I do not know that there are any present means of ascertaining, but as Ochsenheimer borrows no other of Hübner's names, probably by the former; it is, however, a matter of no importance here. Ochsenheimer employed it for *Celtis* only, Hübner with the Fabrician extension. Since the two species are not congeneric, *Libythea* should be used with *carinenta* for its type, and *Hecaerge* for the European species.

1. L. BACHMANII Kirtl. United States, east of the Rocky Mountains.

Family RURALES Fabr. (1793).

Subfamily VESTALES Herbst (1793).

[ERYCINIDÆ Swains. (1827); ERYCINIDES Boisd. (1840); LEMONIIDÆ Kirb. (1871).]

POLYSTICHTIS Hübn. (1816).

[CALEPHELIS Grote-Rob.] *Type* PAPILIO CÆNEUS Linn.

Head quite small; front a little full, slightly protuberant below, fully as broad as the front view of the eyes; scarcely half as high again as broad; eyes naked; antennæ nearly half as long again as the abdomen, composed of 32 joints, of which twelve form the club; palpi very small, not more than equalling the length of the eye. Fore tibiæ one-fourth (♂) or three-fifths (♀) the length of the hind tibiæ; fore tarsi two-fifths (♂) or more than four-fifths (♀) the length of the fore tibiæ; middle tibiæ a little longer than the hind pair; first superior branch of subcostal nervure of fore wings arising from the middle of the outer four-fifths of the upper border of the cell; the second from midway between this and the tip of the cell; cell half as long as the wing.

1. P. BOREALIS [*Charis borealis* Grote-Rob.]. New York to Michigan.

Subfamily EPHORI Herbst (1793).

[LYCÆNIDA Leach (1815); LYCÆNIDÆ Steph. (1827); LYCÆNIDES Boisd. (1832).]

Tribe ARMATI Hübn. (1816).

[THECLINÆ Butl. 1869.]

THECLA Fabr. (1807).

Type PAPILIO SPINI Wien. Verz.

Head small; front almost flat, barely surpassing the front of the eyes, below slightly tumid, fully two-thirds as broad as the front view of the eyes, twice as high as broad; eyes sparsely and briefly pilose; antennæ half as long again as the abdomen, composed of 28 to 30 joints, of which from eleven to fourteen form a cylindrical club; palpi rather slender, fully half as long again as the eyes. Fore tibiæ about three-quarters the length of the hind tibiæ; middle tibiæ nearly as long as the hind pair; first superior branch of the subcostal nervure of fore wings arising, in the ♀, at or a little beyond the middle of the outer four-fifths of the upper border of the cell; the second midway between this and the apex of the cell, or a little beyond; cell barely half as long as the wing.

1. T. ONTARIO Edw. Canada and New England.

* 2. T. LIPAROPS LeC. [*Thecla strigosa* Harr.]. The originals of Abbot's drawings in the British Museum prove that the *Liparops* of Boisduval and LeConte belongs to this species and that it must therefore retain that name. The butterfly appears about the middle of July. Canada to Georgia, and westward to Iowa.

* 3. T. EDWARDSII Saund. [*Thecla Calanus* Grote-Rob. nec Hübn.]. The larva of this species has never been reared to

maturity; it differs totally in coloration from that of the next species; it moves rapidly and eats little holes in oak leaves. Same range as the next species.

* 4. T. Calanus [*Rusticus arm. Calanus* Hübn.; *Pol. Falacer* God.; *Thecla inorata* Grote-Rob.]. Those wishing to breed this insect must beware of the cannibal propensities of the larvæ; when a little short of food they will not hesitate to devour their brethren; the markings of the larva vary greatly, as Mr. Saunders' published observations prove. Canada to Georgia and westward to Iowa.

† 5. T. Acadica Edw. [*Thecla Souhegan* Whitn.]. I have seen specimens from Nicaragua which, to all appearance, belong to this species; the butterflies appear in July, occasionally also, in early August; they are found in wet places where willow is abundant. I have no knowledge of its capture in Essex County, but it will undoubtedly be found there. Canada and New England.

CALLIPAREUS nov. gen.

Type Strymon Melinus Hübn.

Head pretty small; front nowhere reaching so far forward as the front of the eyes, excepting below, where it is scarcely tumid; it nearly or quite equals in breadth the front view of the eyes and is nearly half as high again as broad; eyes sparsely pilose with moderately short hairs; antennæ considerably longer than the abdomen, composed of 32 joints, of which thirteen or fourteen form the club; palpi slight, nearly half as long again as the eye. Fore tibiæ about four-fifths the length of the hind tibiæ; middle tibiæ scarcely shorter than the hind pair; first superior branch of the subcostal nervure of fore wings arising a little beyond the middle of the upper border of the cell; the second about half way between this and the tip of the cell; cell slightly more than half as long as the wing.

† 1. C. Melinus [*Thecla hyperici* Boisd.-LeC.; *Thecla Silenus* Doubl.; *Thecla humuli* Harr.]. This is a wide-spread species which has been taken as far north as Norway, Maine, and being also not very uncommon in the vicinity of Boston, will doubtless be found in Essex County, wherever hop-vines are accustomed to grow. New England to California and Texas.

MITOURI nov. gen.

Type THECLA SMILACIS Boisd.-LeC.

Head pretty small; front pretty full, the middle half tumid, considerably surpassing the front of the eyes throughout, fully as broad as the front view of the eyes and slightly less than half as high again as broad; eyes very sparsely pilose with not very long hairs; antennæ considerably longer than the abdomen, composed of 28 joints, of which eleven or twelve form a depressed club, palpi moderately slender, scarcely half as long again as the eye. Fore tibiæ more than three-fourths the length of the hind tibiæ; middle tibiæ but little shorter than the hind pair; first superior branch of the subcostal nervure of the fore wings arising, in the ♀, a little beyond the middle of the upper border of the cell; the second a very little more than half way from there to the origin of the first inferior subcostal nervule; cell scarcely half as long as the wing.

* 1. M. SMILACIS [*Thecla Auburniana* Harr.; *?Pap. Damon* Cram.; *?Pol. Damastus* God.]. The butterflies appear from the middle of May to the middle of June, and specimens, apparently of a second brood, have been taken in early August; they are found about red cedars. New England to Florida.

INCISALIA Minot Mss.

Type LICUS NIPHON Hübner.

Head small; front nearly flat, beneath a little tumid and scarcely surpassing the front of the eyes; as broad as the eyes on a front view and about half as high as broad; eyes rather densely pilose; antennæ considerably longer than the abdomen, composed of 32 or 33 joints, of which from fourteen to sixteen form a cylindrical depressed club; palpi slender, about half as long again as the eye. Fore tibiæ about five-sixths the length of the hind tibiæ; middle tibiæ scarcely or not exceeding the hind pair in length; first superior branch of the subcostal nervure of the fore wings arising, in the ♀, at or a little beyond the middle of the upper margin of the cell; the second at two-thirds the distance from there to the origin of the first inferior subcostal nervule; cell a little less than half as long as the wing.

This genus is very closely allied to, but yet distinct from, *Licus* Hubn., the type of which is *Pap. rubi* Linn.

* 1. I. AUGUSTUS [*Incisalia Augustus* Min. Mss.; *Thecla*

Augustus Kirb.; *Thecla Augustinus* Westw.]. This butterfly, which occurs at the same time as the next species, is fond of alighting on dead twigs; it flies low. The caterpillar, when young, feeds upon the flowers of the common whortleberry, often concealing itself within them. Canada and New England.

* 2. I. Niphon [*Incisalia Niphon* Min. Mss.; *Licus Niphon* Hübn.]. The butterfly may be taken all through the month of May. The larva feeds upon pine, but Mr. Emery, of Springfield, has almost always found the butterfly on Lupinus perennis among the scrub-pines and hardly ever upon the pines themselves. Canada to Georgia.

† 3. I. Irus [*Pol. Irus* God.; *Thecla Arsace* Boisd.-LeC.; *Thecla Henrici* Grote-Rob.; *Incisalia Henrici* Min. Mss.]. It is doubtful whether this butterfly occurs in Essex County, but it has been occasionally taken near Boston, and even in Maine; it is very abundant further south; in Georgia it feeds on swamp whortleberry. Maine to Georgia.

ERORA nov. gen.

Type Thecla læta Edw.

Head moderately large; front as broad as the eyes on a front view and scarcely half as high again as broad; eyes thinly pilose; palpi slender, but little longer than the eye. Fore tibiæ about four-fifths the length of the hind tibiæ; middle and hind tibiæ of about equal length; first superior branch of the subcostal nervure of fore wings arising, at least in the ♀, a very little beyond the middle of the upper border of the cell; the second about midway between this and the apex; cell slightly more than half as long as the wing.

1. E. læta [*Thecla clothilde* Edw.]. Lower Canada to Virginia.

STRYMON Hübn. (1816).

Type Hesperia Titus Fabr.

Head pretty large; front nearly flat at the lower extremity a little protuberant and then only surpassing the front of the eyes; nearly or quite as broad as the front view of the eyes, and more than half as high again as broad; eyes sparsely pilose with very short hairs; antennæ nearly half as long again as the abdomen, composed of 33 or 34 joints, of which the last fourteen form an elongated cylindrical club; palpi slender, rather compact, but little longer than the eye. Fore tibiæ about four-fifths the length of the hind tibiæ; first superior branch of the subcostal nervure of fore wings arising, in the ♀, in the middle of the outer four-fifths of the upper margin of the cell; the second at less than one-third of the distance from there to the apex of the cell; cell half as long as the wing.

* 1. S. Titus [*Strym. Mopsus* Hübn.]. All we know of the earlier stages of this interesting species is from the published observations of Mr. Saunders. It appears about the middle of July and continues on the wing for less than a month. Canada to Georgia, and westward to the Rocky Mountains.

Tribe ADOLESCENTES Hübn. (1816).

[Lycaeninæ Butl., 1869, pars.]

LYCÆIDES Hübn. (1816).

Type Papilio Argus Linn.

Head small; front flat, very slightly tumid beneath, scarcely surpassing the front of the eyes, fully as broad as they, scarcely half as high again as broad; eyes naked; antennæ scarcely longer than the abdomen, composed of about 32 joints, of which the last twelve or thirteen form the club; palpi slender, nearly or quite twice as long as the eye. Fore tibiæ a little more than five-eighths the length of the hind tibiæ; middle tibiæ scarcely four-fifths the length of the hind pair; first superior branch of the subcostal nervure of the fore wings arising in the middle of the outer two-thirds of the upper border of the cell; the second midway between it and the origin of the first inferior subcostal nervule; cell somewhat more than half as long as the wing.

1. L. Scudderii [*Lyc. Scudderii* Edw.]. Canada and New York.

GLAUCOPSYCHE nov. gen.

Type Lycæna Lygdamus Doubl.

Head small; front nearly flat, below considerably tumid, as broad as the front view of the eyes, scarcely half as high again as broad; eyes delicately and sparsely pilose, with very short hairs; antennæ considerably longer than the abdomen, composed of about 31 joints, of which twelve form the club; palpi slender, compressed, scarcely more than half as long again as the eye. Fore tibiæ two-thirds the length of the hind tibiæ; middle pair one-sixth shorter than the hinder ones; first superior branch of the subcostal nervure of fore wings arising somewhat beyond the middle of the upper border of the cell; the second midway between this and the origin of the first inferior branch; cell somewhat more than half as long as the wing.

1. G. PEMBINA [*Lyc. Pembina* Edw.]. Canada.

CYANIRIS Dalm. (1816).

Type PAPILIO ARGIOLUS Linn.

Head small; front very slightly fullest below, barely surpassing the front of the eyes, as broad as the front view of the same, and scarcely twice as high as broad; eyes delicately and sparsely pilose, with short hairs; antennæ slightly longer than the abdomen, composed of about 34 joints, of which the last twelve or thirteen form the club; palpi slender, scarcely more than half as long again as the eyes. Fore tibiæ a little more than three-fifths, the middle pair nearly five-sixths, the length of the hind tibiæ; first superior branch of the subcostal nervure of fore wings arising at scarcely two-thirds the distance from the base to the apex of the cell; the second at less than half way from the origin of the first to the apex of the cell; cell half as long as the wing.

1. C. PSEUDARGIOLUS [*Argus pseudargiolus* Boisd.-LeC.]. Southern states.

* 2. C. NEGLECTA [*Lyc. neglecta* Edw.]. A male, unquestionably of this species, and apparently just from the chrysalis, was taken by Mr. Sanborn, in Andover, Essex County, so late as July 19th, fully a month later than usual. Northern states, westward to Minnesota.

* 3. C. VIOLACEA [*Lyc. violacea* Edw.]. In New England the females of this species are invariably blue, excepting sometimes in the southernmost parts, presenting a case analogous to that of *Euph. Glaucus*. It is not a very uncommon species, and, in New England, has hitherto been confounded with the others. Canada to Virginia, and west to Iowa.

* 4. C. LUCIA [*Pol. Lucia* Kirb.]. The larva just emerged from the egg has a very different appearance from the full grown caterpillar; it is covered with high, conical warts, from which emerge very long curved hairs, sweeping backward. New England and Canada.

EVERES Hübn. (1816).

Type Papilio Amyntas Fabr.

Head small; front nearly flat, a very little bulbous below, barely protruding beyond the front of the eyes, scarcely two-thirds as broad as the front view of the same, twice as high as broad; eyes naked; antennæ barely longer than the abdomen, composed of about 32 joints, of which twelve form a depressed elongate club; palpi slender, less than twice as long as the eye. Fore tibiæ three-fourths the length of the hind tibiæ; middle pair a little shorter than the hind pair; first superior branch of the subcostal nervure of the fore wings a little beyond the middle of the upper border of the cell; the second arising at about one-fourth the distance from the origin of the first to the apex of the cell; cell scarcely half as long as the wing.

* 1. P. Comyntas. The chrysalis, obtained by Dr. Harris, has never been described; it is much longer and slenderer than in *Cyaniris*, being nearly four times as long as broad, and is covered with distant long hairs, by which it may readily be distinguished. Canada to Florida, and westward at least to Missouri.

2. P. amyntula [*Lyc. amyntula* Boisd.]. Is it distinct from the preceding? California.

Tribe VILLICANTES Hübn. (1816).

CHRYSOPHANUS Hübn. (1816).

Type Papilio Hyllus Cram.

Head moderately large; front perfectly even, as broad as the front view of the eyes, and half as high again as broad; eyes naked; antennæ nearly or not quite half as long again as the abdomen, composed of 33 joints, of which thirteen form a depressed, cylindrical club: palpi slender, fully half as long again as the eye. Fore tibiæ less than three-fourths (♂) or about five-sixths (♀) the length of the hind tibiæ; middle tibiæ as long as (♀) or a little shorter than (♂) the hind pair; first superior branch of the subcostal nervure of the fore wings arising beyond the middle of the upper border of the cell; further outward in the ♀ than in the ♂; the second about two-thirds (♂) or nearly three-fifths (♀) the distance from the origin of the first to the apex of the cell; cell rather less than half as long as the wing.

As *Lycœna* must be used for *Pap. Phlœas* Linn., and its allies, I have restricted the Hübnerian genus to one of the non-typical species.

1. C. Hyllus [*Pol. Thoe* Boisd.-LeC.]. New England, westward to Michigan.

LYCAENA Fabr. (1807).

Type Papilio Phlæas Linn.

Head moderately small; front flat, below slightly tumid, barely surpassing, at a single point, the front of the eyes, as wide as the front view of the same, and less than half as high again as broad; eyes naked; antennæ half as long again as the abdomen, composed of 31 joints, of which twelve form a strongly depressed elongated club; palpi quite slender, rather less than half as long again as the eye. Fore tibiæ scarcely (♂) or a little (♀) shorter than the hind pair; middle tibiæ of the same length as the hind pair (♂) or a little shorter than they (♀); first superior branch of the subcostal nervure of the fore wings arising at the middle of the outer four-fifths of the upper margin of the cell; the second midway between the origin of the first superior and first inferior branches; cell half as long as the wing.

This genus was founded by Fabricius on a large number of *Ephori*, all the tribes being represented; most of the species enumerated appertain to the *Adolescentes*, and the name has generally been used for some of these, but incorrectly, the English entomologists having first restricted it to the *Villicantes*. The first to limit it was Leach, in 1815; he eliminated the *Adolescentes;* Hübner, in the following years totally misapplied the name, referring to it one of the *Vestales*. In 1828 Horsfield applied it to the *Villicantes* alone; and in 1832 Swainson specified *Pap. Phlœas*, Linn. as the type.

* 1. L. Americana Harr. The eggs are laid on sorrel leaves, usually on the rounded surface near the base, but very frequently, also, on the leaf itself, either on the upper or lower surface; only one is laid upon a leaf, but several upon a single plant; they hatch in from seven to nine days. Nova Scotia to Georgia.

* 2. L. Epixanthe [*Pol. Epixanthe* Boisd.-LeC.]. This species is confined to very limited localities, the caterpillar evidently feeding upon some plant that grows in boggy ground. The butterfly is fond of cranberry blossoms. Newfoundland to Pennsylvania; westward to Minnesota.

FENISECA Grote.

Type HESPERIA TARQUINIUS Fabr.

Head moderately large; front flat, the lower half projecting slightly beyond the front of the eyes, scarcely as broad as the front view of the same, and half as high again as broad; eyes naked; antennæ of the length of the abdomen, composed of 30 joints, of which from eleven to thirteen form a gradually incrassating club; palpi very slender, about half as long again as the eye. Fore tibiæ scarcely (♂) or somewhat (♀) shorter than the hind pair; middle tibiæ scarcely shorter than the hind pair; first superior branch of the subcostal nervure of the fore wings arising at about the middle of the outer two-thirds of the upper margin of the cell; the second scarcely half way from this to the tip of the cell; cell half as long as the wing.

1. F. TARQUINIUS [*Pol. Crataegi* Boisd.-LeC.; *Pol. Porsenna* Scudd.]. Nova Scotia to Florida.

Family PAPILIONIDES Latr. restr. (1802).

[PAPILIONIDA Steph. 1850.]

Subfamily DANAI Linn. restr. (1758).

[PIERIDES Boisd. (1836); PIERINÆ Swains. (1840); PIERIDÆ Dup. (1846).]

Tribe FUGACIA Hübn. enl. (1816).

[RHODOCERIDI Steph. 1850.]

CATOPSILIA Hübn. (1816).

[CALLIDRYAS Boisd. 1833.] *Type* PAPILIO CROCALE Cram.

Head pretty large; front depressed above, tumid laterally and below, projecting considerably beyond the front of the eyes, nearly as broad as the front view of the eyes, and as broad as high; eyes naked; antennæ of the length of the abdomen, composed of 43 joints, of which the last ten or eleven form a scarcely depressed, cylindrical club; palpi short and very stout, half as long again as the eye. Fore tibiæ but little more than half as long as the middle tibiæ; hind femora one half (♂) or three-fifths (♀) as long as the middle femora; first superior branch of subcostal nervure of fore wings arising but little beyond the middle of the upper border of the cell; the second shortly before the apex of the cell; cell half as long as the wing.

1. C. EUBULE [*Pap. Eubule* Linn.]. Southern New England to Guatemala.

ZERENE Hübn. (1816).

[MEGANOSTOMA Reak. 1863.] *Type* PAPILIO CÆSONIA Stoll.'

Head pretty large; front rather broadly and considerably protuberant down the middle, especially on the lower half, about as broad as the front view of the eyes, and broader than high; antennæ nearly as long as the abdomen, composed of about 34 joints, of which eight or nine form a very gradually thickening, cylindrical club; palpi short and rather stout, scarcely half as long again as the eye. Fore tibiæ three-fifths the length of the middle tibiæ; hind femora a little more than half as long as the middle femora, in both sexes; first superior branch of the subcostal nervure of the fore wings arising just beyond the middle of the upper border of the cell; the second shortly before the apex of the cell, in both cases a little further out in the ♀ than in the ♂; cell half as long as the wing.

Since the typical species of *Zerene* of Hübner fall into the much older genus *Colias*, the name may be retained for the last species *Pap. Cæsonia* of Stoll.' That this ought to be preferred to *Meganostoma* of Reakirt, follows, from my suggestion in 1862,* that the former should be retained for the two species here catalogued.

1. Z. CÆSONIA. Western and southern states, as far south as Guatemala.

2. Z. EURYDICE Boisd. [*Col. Eurydice* Boisd.; *Col. Wosnesenskii* Men.]. California.

COLIAS Fabr. (1807).

Type PAPILIO PALÆNO Linn.

Head pretty large; front a little protuberant down the middle, otherwise nearly flat, nearly as broad as the front view of the eyes, as high as broad; eyes naked; antennæ no longer than the abdomen, composed of about 30 joints, of which nine or ten form a nearly cylindrical club; palpi pretty stout, rather more than half as long again as the eye. Fore tibiæ a little more than two-thirds as long as the middle tibiæ; hind femora two-thirds (♂) or more than three-fourths (♀) as long as the middle pair; first superior subcostal branch of the fore wings arising at the middle of the outer two-thirds (♂) or a little beyond the middle (♀) of the upper border of the cell; the second a little (♂) or considerably (♀) beyond the apex of the cell; cell a little less than half as long as the wing.

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* Proc. Bost. Soc. Nat. Hist., IX. 103.

1. C. PALIDNE Boisd. [*Col. Labradorensis* Scudd.; *Col. Anthyale* Möschl. nec Hübn.]. Labrador to northern New England.

* 2. C. PHILODICE God. [*Col. Dorippe* God.; *Col. Europome* Steph.; *Zerene Anthyale* Hübn.]. The eggs are laid singly on the upper surface of clover leaves, never more than one on a trefoil, upon or near the middle of one of the halves of a leaf; they hatch in five days. St. Lawrence to West Virginia; Atlantic coast to Rocky Mountains.

3. C. EURYTHAME Boisd. [*Col. Amphidusa* Boisd.] Western half of the United States, occasionally appearing as far as the Atlantic coast.

4. C. KEEWAYDIN Edw. Its range is probably the same as that of the preceding.

EUREMA Hübn. (1816).

Type PAPILIO DELIA Cramer.

Head not very large; front very slightly and pretty uniformly tumid, scarcely more than half as broad as the front view of the eyes, a little higher than broad; eyes naked; antennæ scarcely more than three-quarters as long as the abdomen, composed of 35 joints, of which about fourteen form a pretty strongly compressed, cylindrical club; palpi moderately slender, scarcely longer than the eye. Fore tibiæ about two-thirds the length of the middle pair; hind femora fully four-fifths (♀) or nearly three-fourths (♂) as long as the middle pair; first superior branch of the subcostal nervure of the fore wings arising in the middle of the outer two-thirds of the upper border of the cell; cell a little less than half as long as the wing.

† 1. E. LISA [*Xanth. Lisa* Boisd.-LeC.; *Pieris smilax* God. nec Don.; *Terias sulphurina* Poey.]. This species has been seen in the vicinity of Boston, and taken also at the Isles of Shoals; it is not improbable that in some sunny, sheltered spot along the coast of Essex County, some fortunate person may one day, capture a single specimen. Cuba to southern New England.

ABÆIS Hübn. (1816).

Type PAPILIO NICIPPE Cram.

Head pretty large; front pretty largely and regularly tumid; about three-quarters as broad as the front view of the eyes, somewhat higher than broad; eyes naked; antennæ considerably shorter than the abdomen, composed of about 36 joints, of which ten or eleven form a strongly compressed club; palpi stout, considerably longer than the eye. Fore tibiæ more than three-fifths the length of the middle tibiæ; hind femora two-thirds the length of the middle pair, alike in both sexes; first superior branch of the subcostal nervure of the fore wings arising before the middle of the outer two-thirds of the upper border of the cell; the second at the apex of the cell; cell considerably less than half as long as the wing.

1. A. NICIPPE. Southern New England to Guatemala.

Tribe VORACIA Hübn. (1816).

[PIERIDI Steph. 1850.]

ASCIA Scop. (1777).

Type PAPILIO MONUSTE Linn.

Head moderately large; front very greatly swollen, surpassing but little the front of the eyes, a little narrower than the front view of the eyes, considerably broader than high; eyes naked; antennæ considerably longer than the abdomen, composed of about 42 joints, of which twelve form a pretty long, obconic club; palpi slender, half as long again as the eye. Fore tibiæ scarcely more than half the length of the middle pair; hind femora slightly less (♀) or slightly more (♂) than three-quarters the length of the middle pair; first superior branch of the subcostal nervure arising beyond the middle of the outer two-thirds of the upper border of the cell; the second more than half way from there to the tip of the cell; cell a little more than half as long as the wing.

The genus *Synchloe* of Hübner, as defined by Butler in 1870, is composed of several genera, as will appear from the treatment of the *Voracia* in the present paper. We have therefore endeavored to restore to some of the divisions, old generic names, which have been neglected. *Ascia* was employed by Scopoli for four species, and one of them being *Pap. Monuste*, we would restrict it to that species and its immediate allies.

The type of *Pieris* Schrank (1801), judged by its subsequent limitation by authors, seems to be *Pap. brassicæ* Linn. of Europe, and we therefore would restrict it to that species and its congeners, placing it between the genera Ascia and Ganoris, as here defined. For the small white butterflies *Ganoris* of Dalman, may have the preference over *Catophaga* of Hübner, since, while it is impossible to say which has the priority, neither name has been in use, and the labors of the sharp sighted naturalist who was the first to seize upon the most important structural features as a basis for the classification of butterflies, should receive every possible recognition. Finally, we would use *Synchloe* of Hübner in his own sense, and not with the extension proposed by Butler in his Cistula entomologica.

1. A. MONUSTE [*Pieris Cleomes* Boisd.-LeC.]. Southern states.

GANORIS Dalm. (1816).

Type PAPILIO RAPÆ Linn.

Head moderately large; front tumid, particularly in the middle; as broad as the front view of the eyes, and of equal breadth and height; eyes naked; antennæ considerably longer than the abdomen, composed of about 32 joints, of which seven or eight form a depressed, subspatulate club; palpi slender, nearly half as long again as the eye. Fore and middle tibiæ of equal length; hind femora a little more than half as long as the middle pair; first superior branch of the subcostal nervure of the fore wings arising in the middle of the outer two-thirds of the upper margin of the cell; the second originating a little before the tip of the cell; cell three-fifths of the wing.

See the remarks under the preceding genus.

* 1. G. RAPÆ. The eggs are laid erect in large numbers, but not in contiguity (as they are in Pieris) on the under, occasionally on the upper surface of cabbage and turnip leaves, not on the ribs; they may be found throughout the season. I suspect that the insect has been introduced independently at New York. Europe; rapidly spreading through the north-eastern portion of the United States.

* 2. G. OLERACEA [*Pontia oleracea* Harr.; *Pontia casta* Kirb.; *Pieris cruciferarum* Boisd.]. The eggs are laid in the latter part of August, erect on the under surface of turnip leaves, not on the ribs, several on a leaf, and occasionally pretty near together. The eastern half of North America, as far south as Pennsylvania.

3. G. VIRGINIENSIS [*Pier. Virginiensis* Edw.]. Ontario and Western Virginia.

SYNCHLOE Hübn. (1816).

Type PAPILIO CALLIDICE Esp.

Head moderately large; front tumid, especially in the middle, fully as broad as the front view of the eyes, considerably broader than high; eyes naked; antennæ a little longer than the abdomen, composed of about 33 joints, of which eight form a strongly compressed, spatulate club, palpi very slender, less than twice as long as the eye. Fore tibiæ about three-fifths the length of the middle tibiæ; hind femora five-sixths (♂) or two-thirds (♀) as long as the middle pair; first superior branch of the subcostal nervure of the fore wings originating shortly before the middle of the outer half of the upper border of the cell, a little further outward in the female than in the male; the second arising scarcely (♂) or a very little (♀) beyond the apex of the cell; cell half as long as the wing.

See the remarks under the genus Ascia.

1. S. PROTODICE [*Pier. Protodice* Boisd.-LeC.]. Southern New England to Georgia; westward to the Pacific coast.

2. S. VERNALIS [*Pier. vernalis* Edw.]. New Jersey to Colorado.

Tribe FRUGALIA Hübn. restr. (1816).

EUCHLOE Hübn. (1816).

[MIDEA Herr.-Schæff., 1867.] *Type* MANCIPIUM VORAX MIDEA Hübn.

Head not very large; front excessively protuberant, a little broader than the front view of the eyes, of equal height and breadth; antennæ shorter than the abdomen, composed of about 30 joints, of which nine form an ovate, depressed club; palpi slender, about half as long as the eye; fore tibiæ three-quarters (♂) or quite (♀) the length of the middle tibiæ; hind femora about four-fifths (♂) or a little more than three-fifths (♀) as long as the middle pair; first superior branch of the subcostal nervure originating at about the middle of the upper margin of the cell; the second at the apex of the same; cell considerably more than half as long as the wing.

Hübner's genus and *Anthocaris* of Boisduval were originally synonymous, since both authors included in them the species here catalogued, as well as those peculiar to Europe. Herrich-Schæffer was the first to suggest a division, but in doing so, he proposed a new generic name for the American species; since, however, he retained *Anthocaris* for the European species, Hübner's older name must be applied to this.

1. E. Genutia [*Pap. Genutia* Fabr.; *Pieris Lherminieri* God.; *Mancipium var. Midea* Hübn.]. Southern New England to Georgia and Texas.

Subfamily EQUITES Linn. (1758).

[Papilioninæ Swains. (1840); Papilionidi Steph. (1850).]

LAERTIAS Hübn.

Type Papilio Philenor Linn.

Head large; front very little tumid, a little more than three-fourths as broad as the front view of the eyes, scarcely higher than broad; eyes naked; antennæ a little longer than the abdomen, consisting of 38 joints, of which ten or eleven form a cylindrical club, flattened beneath; palpi very slender, reaching the middle of the front of the eye. Fore femora and tarsi of equal length, and nearly half as long again as the fore tibiæ; middle tibiæ as long (♂) or five-sixths as long (♀) as the middle femora; first superior branch of the subcostal nervure of fore wings arising in the middle of the outer four-fifths of the upper margin of the cell; the second at less than one-third the distance from that to the apex of the cell; cell somewhat more than half as long as the wing.

1. L. Philenor [*Pap. Asterias* Drury]. Southern New England to Florida; westward to the Pacific.

PTEROURUS Scop. (1777).

Type Papilio Troilus Linnæus.

Head large: front but little tumid, nearly as broad as the front view of the eyes, fully as broad as high; eyes naked; antennæ as long as the abdomen, composed of forty-four joints, of which thirteen or fourteen form a considerably compressed club; palpi pretty slender, reaching the middle of the front of the eye. Fore femora and tarsi of equal length, and more than half as long again as the fore tibiæ; middle tibiæ scarcely (♂) or a little (♀) shorter than the middle femora; first superior branch of the subcostal nervure arising just before the middle of the outer half of the upper border of the cell; the second midway between this and the apex of the cell; cell much more than half as long as the wing.

We have retained this ancient name of Scopoli's for one of the species mentioned by him.

* 1. P. Troilus [*Pap. Ilioneus* Smith-Abb.]. The eggs are laid early in June on the under surface of sassafras and other leaves; the parent generally selects small bushes and trees and deposits but a single egg upon each. Canada to Florida; westward to Michigan, at least.

EUPHŒADES Hübn. (1816).

Type Papilio Glaucus Linn.

Head large; front somewhat tumid, slightly broader than the front view of the eyes and scarcely broader than high; eyes naked; antennæ slightly longer than the abdomen, composed of 40 joints, of which twelve form a compressed, cylindrical club; palpi pretty slender, reaching to the middle of the front of the eye. Fore femora and tarsi of about equal length, and one-third longer than the tibia; middle tibiæ scarcely (♂) or a little more than (♀) five-sixths the length of the femora; first superior branch of the subcostal nervure of the fore wings arising just before the middle of the outer half of the cell; the second midway between this and the apex of the cell; cell considerably more than half as long as the wing.

* 1. E. Glaucus [*Pap. Turnus* Linn.; *Pap. Alcidamas* Cram.; *Pap. Rutulus* Boisd.]. The eggs are laid in the latter part of June, upon the upper surface of leaves of small trees (birch, wild-cherry, etc.), on the branches nearest the ground; only one or two eggs are laid upon a single tree, and they hatch in eight days. Nearly the whole of North America.

IPHICLIDES Hübn. (1816).

Type Papilio Podalirius Linnæus.

Head large; front somewhat tumid, rather broader than the front of the eyes, and of about equal height and breadth; eyes naked; antennæ scarcely longer than the abdomen, composed of 41 joints, of which ten or eleven form a depressed, cylindrical club; palpi slender, reaching the middle of the front of the eye. Fore tarsi slightly longer than fore femora, and more than one-third longer than fore tibiæ; middle tibiæ a little more than two-thirds the length of the femora, at least in the male; first superior branch of the subcostal nervure of the fore wings arising from somewhat beyond the middle of the outer two-thirds of the upper border of the cell; the second scarcely more than half way from here to the apex of the cell; cell three-fifths the length of the wing.

Not being sure, from personal examination, that all the species placed in this genus by Hübner are strictly congeneric (as is certainly not the case in some of his neighboring genera) I have retained as the type, the best known of the species enumerated by him.

1. I. Ajax [*Pap. Ajax* Linn.; *Pap. Marcellus* Cram.; *Pap. Telamonides* Feld.]. Southern states and northward to New York; westward to Iowa.

AMARYSSUS Dalm. (1816).

Type Papilio Machaon Linnæus.

Head large; front somewhat tumid, of about the width of the front view of the eyes and fully as high as broad; eyes naked; antennæ a little longer than the abdomen, composed of 34 joints of which ten form a triquetral club; palpi rather stout, reaching the middle of the front of the eye. Fore femora and tarsi of about equal length in ♀, the femora much shorter in the ♂; tibiæ about five-sixths as long as the fore tarsi; middle tibiæ fully as long as (♀) or somewhat shorter than (♂) the middle femora; first superior branch of the subcostal nervure of the fore wings arising just beyond (♂) or before (♀) the middle of the anterior two-thirds of the upper border of the cell; the second a little more (♂) or a little less (♀) than half way from this to the apex of the cell; cell much more than half as long as the wing.

* 1. A. Polyxenes [*Pap. Polyxenes* Fabr.; *Pap. Asterias* Fabr.; *Pap. Troilus* Drury; *Pap. Calverlyi* Grote]. The egg is laid upon the upper side of leaves of cruciferous plants, one on a leaf. They are usually attached either to the midrib or to one of the side ribs, and are deposited in the first half of June and the latter part of August. From the St. Lawrence to the Gulf of Mexico, and westward to the Rocky Mountains.

Family URBICOLÆ Fabr. (1793).

[HESPERIDES Latr. (1809); HESPERIDÆ Leach (1809); HESPERIDI Boisd. (1829); HESPERIIDÆ Steph. (1829).

PYRRHOPYGA Hübn.

Type PAPILIO BIXÆ Linnæus.

1. P. AFFINIS Herr.-Schæff. Mazatlan.

2. P. VENEZUELÆ nov. sp. Allied to *Acastus* Cr. Basal half of palpi, double row of spots on under surface of sides of abdomen, and the tip of abdomen crimson, on the first and last mentioned with solferino reflections; lateral stripe beneath base of fore wings and middle three-fourths of costal margin of hind wings scarlet; apical half of palpi and top of head steel blue — wings steel blue with white fringe, the fore wings above tinged with green on the basal half; outer border of under surface of hind wings broadly bordered with citron yellow, not reaching the inner border. Venezuela.

3. P. CHALYBEA nov. sp. Allied to *Hygieia* Feld. Fore wings metallic green; hind wings steel blue; fringe of all the wings pale orange; hind wings with a moderately broad border of a similar color, broadest next inner margin, equal above and below. Mexico.

DYSENIUS nov. gen.

Type ERYCIDES ALBICILLA Herr.-Schæff.

1. D. ALBICILLA. Tehuantepec.

2. D. CRUENTUS nov. sp. Much smaller than the preceding, but with the wings of a similar color, and as there, with a uniform white fringe; just before the middle of the costal border is a quadrate, sanguineous spot, seated on the median nervure, its outer angle at the second divarication of the same and reaching continuously to the costal edge, which its outer half touches; the spot is nearly twice as broad, from the median nervure to the costal margin, as long. Expanse $55^{mm.}$ Guatemala.

ERYCIDES Hübn.

Type PAPILIO PIGMALION Cram.

1. E. URANIA Westw.-Hewits. Texas [Capt. Pope, Mexican Boundary Survey]. Guatemala.

2. E. TEXANA nov. sp. Very closely allied to the preceding with a precisely similar arrangement of the glassy spots on the fore wings; but it lacks entirely the greenish markings of the upper surface of the fore wings; the markings of the hind wings which in *E. Urania* are bright green, are here very pale dull yellowish brown. Texas (Capt. Pope, Mexican Boundary Survey).

3. E. SANGUINEA nov. sp. Head above blackish with bright blue spots, remainder and the palpi excepting the blackish apical joint, bright orange. Thorax with four longitudinal bright blue streaks; wings blackish chalybeate; in the middle of the cell a blood red spot and just above it, separated only by the nervure, another of similar size, both on the upper and under surface of the wings; base of the fore wings above, as far as these spots, and beyond them on the costal border half way to the apex, longitudinally streaked with metallic blue; fringe of all the wings white, the color encroaching on the wing itself on the hind wings. Expanse 72$^{mm.}$ Texas (Capt. Pope, Mexican Boundary Survey).

THYMELE Fabr.

Type PAPILIO PROTEUS Linn.

1. T. SIMPLICIUS [*Pap. simplicius* Stoll']. Borders of Arizona and Sonora (W. H. Edwards), Texas (Capt. Pope, Mexican Boundary Survey), Peru, Venezuela, Tehuantepec, Guatemala.

2. T. SANTIAGO [*Eud. Santiago* Luc.; *Gon. cariosa* Herr.-Schæff.]. Cuba.

3. T. PROTILLUS [*Eud. Protillus* Herr.-Schæff.]. Specimens which appear to be referable to this species come from Tehuantepec, Guatemala and Brazil.

4. T. VITREUS nov. sp. Allied to *Caunus* Herr.-Schæff. Wings dark slate brown; the glassy flecks forming the transverse mesial band of the fore wings are five in number, the upper and lower very small, the middle one small, just outside the others, situated close to the base of the upper median interspace; the other two are large and of irregular shape; and all, excepting the middle one, lie in a straight line, and are edged very narrowly with dark brown scales; the four apical ones also lie in a straight series, subparallel to the other; in the medio-submedian interspace are two roundish brown spots with a pale pupil, a little before and a little beyond the middle of the interspace; the bands of the under surface of the hind

wings are greatly broken and obsolescent; tails tapering considerably; fringe of fore wings pale at apex and in median area; of the hind wings pale above the tail; elsewhere darker than the wings. Venezuela.

5. T. SUMICHRASTI nov. sp. The mesial band of the fore wings of this species, which resembles *T. Santiago* in general appearance above, is straight, at right angles to the costal border, slender, scarcely surpassing the lower median nervule and only present above the subcostal as a small spot a little outside the stripe; in the upper median interspace there is only a dot just below the tip of the cell; midway between the upper extremity of the mesial stripe and the apex of the wing, there are two minute spots in the subcostal interspaces, and in the interspace below the lower a mere dot, removed toward the outer border; tails nearly black above and below. Beneath the wing is mostly ochrey gray, the hind wing heavily blotched with bluish black, principally forming a transverse band before the middle of the wing, which, above the cell, divides into two: a second much narrower stripe lies midway between the lower portion of this and the outer border, touching with its tip the greatly broadened outer branch of the inner band; wings edged with a black line on the outer border; base of fore wings dusky; apex of same blue black above, at extreme tip ashy. Expanse 49$^{\mathrm{mm.}}$ Tehuantepec.

6. T. TARCHON [*Telegonus Tarchon* Hübn.]. Venezuela.

7. T. DOMINGO nov. sp. Resembles *T. Proteus*, in the size and disposition of the vitreous markings, but the hairs of the upper surface of the thorax and base of wings are of the general blackish brown of the wings, beneath the hind wings have the outer border broadly margined below the subcostal nervules with dark brown, besides which there is a broad band of similar color, with rather vague outline in the middle of the outer half of the wing, fading out toward either end; and markings of a similar color but of rather deeper intensity midway between this and the base — a transverse broad bar stretching from the submedian to the subcostal nervure and above the subcostal nervure two quadrate spots on either side of where an extension of the bar would have lain; the bar is faintly edged externally with white in the cell. Expanse 56$^{\mathrm{mm.}}$ Hayti.

8. T. PROTEUS. Eastern North America as far north as Connecticut.

9. T. METOPHIS [*Hesp. Metophis* God.]. Guatemala, Tehuantepec.

10. T. Montezuma nov. sp. Wings above of the same color and with a mesial band of the same character as in *Epay. Pityrus*, but scarcely so waxen in tint, and angularly parted just below the cell; midway between this band and the outer border or nearer the former is a large quadrate spot in the upper median interspace and still nearer the border in the interspace above, an inconspicuous transverse line; depending from the costa, more than half way from the band to the apex of the wing is an arcuate series of four dashes, the lower removed a little outward. Beneath the fore wings are clouded with fuliginous brown and ashy lilac and the hind wings are dull roseate brown, heavily blotched with blackish; there is a large basal spot seated on the subcostal; a broad transverse stripe, made up of three nearly equal blotches, crossing the origin of the first subcostal and first median nervules, and a nearly equally broad arcuate band, extending from the base of the upper median nervule to the extreme base of the tail, bordered toward the outer border with a very large white patch, much broader toward the middle of the wing, its outer limits separated from the outer border by a dusky equal margin, as broad as the arcuate stripe, and which extends to the costal border; in the middle of the basal two-thirds of the lower subcostal and upper median interspaces and between them are two or three smaller transverse blackish blotches. Expanse 63$^{\mathrm{mm.}}$ Tehuantepec.

EPARGYREUS Hübn. (1816).

Type Papilio Tityrus Fabr.

* 1. E. Tityrus. New England to Florida.

2. E. Orizaba nov. sp. Differs from the preceding species in having the basal half of the hind wings much more heavily clothed with tawny hairs, in having the mesial stripe of the fore wings reduced to much smaller disconnected spots, and the other spots of the fore wings much smaller; beneath, the hind wings differ in having the silvery patch reduced to a single large lunate spot, which does not pass above the median nervure, and a minute spot at the apex of the cell above. Expanse 65$^{\mathrm{mm.}}$ Guatemala.

2. E. Hesus [*Goniloba Hesus* Westw.-Hewits.]. Texas (Capt. Pope, Mexican Boundary Survey).

4. E. Zestos [*Proteides Zestos* Hübn.]. Porto Rico (Dr. Bryant).

ACHALARUS nov. gen.

Type PAPILIO LYCIDAS Sm.-Abb.

1. A. LYCIDAS. Southern New England to Florida; west into the Mississippi valley.

ACOLASTUS nov. gen.

Type GONILOBA SAVIGNYI God.

1. A. SAVIGNYI. Key West (E. Burgess), Cuba.

THORYBES nov. gen.

Type PAPILIO BATHYLLUS Sm.-Abb.

1. T. BATHYLLUS. Southern states, and occasionally as far north as Connecticut.

* 2. T. PYLADES [*Endamus Pylades* Scudd.]. Northern states and less frequently in the south.

3. T. NEVADA nov. sp. Closely allied to *T. Bathyllus*, but measuring only 34$^{mm.}$ in expanse of wings. The under surface of hind wings is very delicately marbled with fine short transverse lines, giving the outer half of the wing a hoary appearance; in the lower half of the wing one may distinguish rudiments of two darker bands at about two-fifths and three-fifths the distance from the base, the inner one reaching to the middle of the wing. Sierra Nevada, California (Henry Edwards).

ACHYLODES Hübn. (1816).

Type PAPILIO BUSIRIS Cram.

1. A. THRASS Hübn. Texas (Capt. Pope, Mexican Boundary Survey, and W. H. Edwards).

ERYNNIS Schrank. (1801).

[NISONIADES Hübn. (1816).] *Type* PAPILIO TAGES Linn.

This generic name, originally intended to embrace at least all the European Hesperians, was first restricted by Staudinger (though since repudiated by him) to the European species included by authors in *Nisoniades* Hübn. or *Thanaos* Boisd. I do not see how we can fail to apply it here.

* 1. E. PERSIUS [*Nisoniades Persius* Scudd.]. New England.

* 2. E. LUCILIUS [*Nis. Lucilius* Lintn.]. Canada to Maryland.

* 3. E. ICELUS [*Nis. Icelus* Lintn.]. Canada to West Virginia; Atlantic coast to Michigan.

* 4. E. BRIZO [*Thanaos Brizo* Boisd.-LeC.]. Canada to Florida.

* 5. E. MARTIALIS [*Nis. Martialis* Scudd.]. Massachusetts to Georgia and Missouri.

6. E. TERENTIUS [*Nis. Terentius* Scudd.-Burg.]. Florida.

7. E. FUNERALIS [*Nis. funeralis* Scudd.-Burg.]. Texas.

8. E. OVIDIUS [*Nis. Ovidius* Scudd.-Burg.]. Florida.

* 9. E. ENNIUS [*Nis. Ennius* Scudd.-Burg.]. Northern states.

10. E. JUVENALIS [*Pap. Juvenalis* Sm.-Abb.]. Southern states.

11. E. PROPERTIUS [*Nis. Propertius* Scudd.-Burg.] California.

12. E. TIBULLUS [*Nis. Tibullus* Scudd.-Burg.]. California.

* 13. E. HORATIUS [*Nis. Horatius* Scudd.-Burg.]. New England, Texas.

† 14. E. VIRGILIUS [*Nis. Virgilius* Scudd.-Burg.]. New England.

15. E. TRISTIS [*Thanaos tristis* Boisd.]. California.

16. E. PLAUTUS [*Nis. Plautus* Scudd.-Burg.]. Florida.

PHOLISORA nov. gen.

Type PAPILIO CATULLUS Fabr.

* 1. P. CATULLUS. New England to Gulf of Mexico; Atlantic coast to Rocky Mountains.

2. P. HAYHURSTII [*Hesp. Hayhurstii* Edw.]. Missouri.

3. P. AZTECA nov. sp. Slightly larger than *P. Hayhurstii*, which it resembles in color and general appearance; scarcely any markings, the fore wing being traversed above by an extra mesial broad band, parallel to the outer border, scarcely darker than the ground color of the wings, but made more distinct by being faintly bounded by a slightly paler tint; there are three scarcely perceptible white dots in a transverse row, the middle one a little nearer the base than the others, situated in the middle of the basal two-thirds of the next to the lower subcostal interspace and the two next succeeding superior ones. Tehuantepec.

LEUCOSCIRTES nov. gen.

Type SYRICHTUS ERICETORUM Boisd.

1. L. ERICETORUM [*Syr. alba* Edw.]. California.

2. L. NIVEA nov. sp. Of the size and general appearance of the preceding. White above and below; near the outer margin the nervures are blackish as in *L. Ericetorum;* next the outer margin of the fore wings, nearly or quite confluent blackish brown spots are seated on the nervures, heavier on the anterior than on the posterior half; the costal fold is also blackish above. Beneath the nervures are similarly marked, the basal half of the costal edge of the fore wings is brownish, there are a few small brownish cloudy spots at the apex and along the outer margin of the fore wings; and on the hind wings, two broken, broad, longitudinal, basal streaks, one above the subcostal nervure and the other between the median and submedian nervures; the outer margin of the hind wings is broadly margined with dark brown above the submedian nervure, interrupted between the subcostal and median nervures; within this, slight paler spots are seated on the margin; the outer border of all the wings is marked with a black line above and below, and the fringe is white, interrupted at the nervure tips with brownish. I have seen only males. Tehuantepec, Guatemala.

3. L. OCEANUS [*Syr. oceanus* Edw.]. Borders of Arizona and Mexico, Guatemala, Tehuantepec.

HESPERIA Fabr. (1793).

Type PAPILIO MALVÆ Linnæus.

1. H. SYRICHTUS [*Pap. Syrichtus* Fabr.; *Pap. Orcus* Cram.; *Pap. Oileus* Auct., nec Linn.]. Cuba, Porto Rico, Guatemala, Tehuantepec.

2. H. TESSELLATA nov. sp. [*Syr. Oileus* Boisd. (Calif.).] Differs from the preceding, with which it agrees in size, in having the marginal row of spots of the upper surface of the hind wings, which in *H. Syrichtus* are seated upon the outer border, reduced to a row of mere points, often connected by a white thread to the submarginal spots, and sometimes wholly obsolete; a mesial white band is also brought out in distinct contrast to the surrounding, generally pale greenish parts on the under surface of the same wings, instead of being covered with almost wholly disconnected transverse black lines enclosing here and there dark patches. I have specimens from Penn-

sylvania, Maryland, Iowa, Florida, Alabama, Texas, Missouri and California.

3. H. CRISIA [*Pyrg. Crisia* Herr.-Schæff.]. Cuba, Tehuantepec, Guatemala.

4. H. CENTAUREÆ Ramb. [*Hesp. Wyandot* Edw.]. Labrador, New York, Washington.

5. H. PETREMIS Edw. California.

6. H. MARCELLA Edw. Mss. California.

7. H. RURALIS [*Syr. ruralis* Boisd.; *Hesp. Ricara* Edw.]. California, Colorado.

8. H. CÆSPITALIS [*Syr. cœspitalis* Boisd.]. California.

9. H. SCRIPTURA [*Syr. scriptura* Boisd.]. California. This is the only one of the species here enumerated which I have not examined. I do not think it can be referred to any of them.

CALLIMORMUS nov. gen.

Type CALLIMORMUS JUVENTUS nov. sp.

Allied to the following genus, with longer wings but otherwise of a generally similar shape, the outer margin of the hind wings straighter; palpi with the last joint slender, as long as the rest of the palpus, furnished only with decumbent scales; antennæ fully half as long as the fore wings, the club very long and slender, its recurved portion half as long as the rest, slender, tapering.

1. C. JUVENTUS nov. sp. Wings above uniform dull dark brown, enlivened meagrely with a few fulvous hairs, the fore wings with small, inconspicuous yellowish spots, a little before the middle of the median interspaces; under surface a little griseous on the hind wings and at the apex of the fore wings; in this same portion, the veins are citron yellow and on the fore wings the spots of the upper surface are repeated; under surface of head and palpi yellowish. Expanse 19$^{mm.}$ Length of antennæ 5.75$^{mm.}$ Panama (Henry Edwards).

ANCYLOXYPHA Feld. (1867?).

Type HESPERIA NUMITOR Fabr.

* 1. A. NUMITOR [*Thym. puer* Hubn.; *Het. marginatus* Harr.]. Canada to Florida; west to Michigan.

2. A. NANUS [*Thym. nanus* Herr.-Schæff.]. Cuba.

3. A. BRUNNEA nov. sp. Wings wholly dark chocolate brown, without markings. Expanse 26$^{mm.}$ Guatemala.

OARISMA nov. gen.

Type HESPERIA POWESHIEK Park.

1. O. POWESHIEK. Iowa.

THYMELICUS Hübn. (1816).

Type PAPILIO ACTÆON Rott.

1. T. LINEOLA [*Pap. lineola* Ochs.]. Europe.
2. T. THAUMAS [*Pap. Thaumas* Hübn.]. Europe.
3. T. WACO [*Hesp. Waco* Edw.; *Hesp. minima* Edw.]. Texas.
4. T. ARENE [*Hesp. Arene* Edw.]. Borders of Arizona and Mexico, Guatemala.

POTANTHUS nov. gen.

Type HESPERIA OMAHA Edw.

1. P. OMAHA [*Hesp. Mingo* Edw.]. Virginia.
2. P. CALIFORNICA nov. sp. Differs from the preceding, with which it agrees in size and general appearance in that the longitudinal spot, just beyond the tip of the cell on the upper surface of the fore wings, runs to the costal border and forms a short, hour-glass shaped spot, disconnected with the longitudinal stripe of the middle of the wings; on the under surface of the hind wings, the markings, though similar to those of the preceding species, are much less distinct and contrasted; the mesial band being but little paler than the ground color, and mainly conspicuous by the limiting series of dark disconnected blotches in the interspaces beyond it. California.

CYCLOPIDES Hübn. (1816).

[CARTEROCEPHALUS Led. (1853).] *Type* PAPILIO STEROPES Wien. Verz.

1. C. MANDAN [*Hesp. Mandan* Edw.; ?*Hesp. Mesapano* Scudd.]. Canada and northern New England.
2. C. SKADA [*Hesp. Skada* Edw.]. Kodiak.

AMBLYSCIRTES nov. gen.

Type HESPERIA VIALIS Edw.

† 1. A. VIALIS. Canada to Georgia.
2. A. SAMOSET [*Hesp. Samoset* Scudd.; *Hesp. Hegon* Scudd.;

Hesp. nemoris Edw.; *Hesp. alternata* Grote-Rob.]. Canada to Georgia; westward to Iowa.

3. A. Tolteca nov. sp. Wings blackish brown, flecked beneath with pale olivaceous, furnished on both sides with very small, inequal white spots; fore wings with a double spot in the cell, a transverse slightly arcuate series of three spots, depending from the costa, midway between the discal spots and the apex of the wing, and a nearly straight oblique series of five spots, the upper two mere dots, in a line passing from the apex of the wing to the middle of the inner border, those in the median interspaces largest; hind wings with a spot near the base of the cell, and of the interspaces between the principal nervures (the discal spot, only, repeated on the upper surface), and an extra mesial row of small, roundish white spots, subparallel to the outer border, two of which are situated in the interspace beyond the cell, the lower one a longitudinal dash. Expanse 31$^{mm.}$ Tehuantepec.

STOMYLES nov. gen.

Type Pyrgus textor Hübn.

1. S. textor [*Hesp. Oneko* Scudd.; *Hesp. Wakulla* Edw.]. Florida. The locality — Connecticut — given in my previous lists was erroneous.

OCYTES nov. gen.

Type Hesperia metea Scudd.

1. O. metea. Massachusetts, New Hampshire, New York.

2. O. Seminole nov. sp. Differs from the preceding in being a little larger and in having on the under surface of the hind wings, only five small squarish spots in place of the band, seen in *O. metea* — one in the cell, just beyond the first divarication of the median nervure, the others forming a bent line, that in the middle of the lower subcostal interspace, larger than the others which are situated in a straight row in the median and subcosto-median interspaces, a little nearer the outer border than the central spot. Florida to Texas.

POANES nov. gen.

Type Hesperia Massasoit Scudd.

1. P. Massasoit. Southern New England.

PHYCANASSA nov. gen.

Type HESPERIA VIATOR Edwards.

1. P. VIATOR. Louisiana.

ATRYTONE nov. gen.

Type HESPERIA IOWA Scudd.

1. A. IOWA [*Pap. vitellius* Smith-Abb. (nec Fabr.?)]. Georgia, Iowa.

2. A. LOGAN [*Hesp. Logan* Edw.; *Hesp. Delaware* Edw.]. Southern New England to Florida; westward to Iowa.

3. A. CONSPICUA [*Hesp. conspicua* Edw.]. Michigan, Iowa.

* 4. A. ZABULON [*Hesp. Zabulon* Boisd.-LeC.; *Hesp. Hobomok* Harr.; *Hesp. Pocahontas* Scudd.; *Hesp. Quadaquina* Scudd.]. Canada to Georgia; westward to Iowa.

EUTHYMUS nov. gen.

Type HESPERIA PHYLÆUS Drury.

1. E. PHYLÆUS [*Hesp. colon* Fabr.; *? Hesp. Vitellius* Fabr.]. New York to Peru.

PAMPHILA Fabr. (1807).

Type PAPILIO COMMA Linn.

1. P. JUBA Scudd. [*Hesp. comma* Boisd. (Calif.), nec Linn.]. California, Nevada.

2. P. COLUMBIA nov. sp. Differs from the preceding, with which it agrees in size and general appearance in having the sexual dash on the fore wings of the male, slightly shorter and edged beneath with a brown border as broad as itself, and in having the band on the under surface of the hind wings formed of more closely connected spots; the apical superior tooth of the lateral clasps of the anal appendages is very large, while the subapical tooth is nearly aborted. California (Henry Edwards).

* 3 P. SASSACUS [*Hesp. Sassacus* Harr.]. Maine to Georgia; westward to Iowa.

4. P. NAPA [*Hesp. Napa* Edw.; *Hesp. Dacotah* Edw.; *Hesp. Melane* Edw.]. Iowa, California, Pike's Peak; specimens collected by the late Mr. C. A. Shurtleff were obtained either in Harrisburg, Penn., Washington, D. C., or Vicksburg on the Mississippi.

5. P. Ottoe [*Hesp. Ottoe* Edw.]. Kansas, Iowa.

ATALOPEDES nov. gen.

Type Hesperia Huron Edwards.

1. A. Huron. New York to Texas.
2. A. campestris [*Hesp. campestris* Boisd.]. California.

ANTHOMASTER nov. gen.

Type Hesperia Leonardus Harr.

* 1. A. Leonardus. New Hampshire to Virginia; Massachusetts to Iowa.
2. A. Uncas [*Hesp. Uncas* Edw.]. Pennsylvania.

POLITES nov. gen.

Type Hesperia Peckius Kirb.

* 1. P. Peckius [*Hesp. Wamsutta* Harr.; *Pamph. Enys* Boisd. (undesc.)]. Canada to Pennsylvania; westward to Michigan.
2. P. Sabuleti [*Hesp. Sabuleti* Boisd.]. California.

OCHLODES nov. gen.

Type Hesperia nemorum Boisd.

1. O. nemorum [*Hesp. Yreka* Edw.]. California.
2. O. agricola [*Hesp. agricola* Boisd.]. California.
3. O. Sonora nov. sp. Differs from the preceding species in having a more distinct, slenderer and paler mesial band on the under surface of the hind wings, in having a broader border to the upper surface of all the wings and in having the lower margin of the sexual dash on the upper surface of the fore wings of the male broadly bordered with fuscous. The male has but little resemblance to *sylvanus* of Europe, but the female agrees closely with the description of *Hesp. sylvanoides* Boisd. — a species I have not seen — but lacks the transparent spot near the apex of the fore wings. Expanse ♂ $30^{mm.}$, ♀ $33^{mm.}$ Sierra Nevada (Henry Edwards), California.

AUGIADES Hübn. (1816).

Type Papilio sylvanus Esp.

Mr. Butler has recently designated *Pap. Crinisus* Cram. as the type of this genus. It is true that this is the first species catalogued by Hübner; but since Stephens had previously (1850) restricted the genus to *sylvanus* and *comma* of Europe and as the latter is the type of the earlier genus *Pamphila sylvanus* should be considered as the type of this genus.

1. A. sylvanus. Europe. I have seen nothing resembling it from California.

CHORANTHUS nov. gen.

Type Hesperia radians Lef.

1. C. radians. Cuba.

HEDONE nov. gen.

Type Hesperia Brettus Boisd.-LeC.

1. H. Brettus [*Hesp. Wingina* Scudd.]. Southern New England to Florida.

2. H. præceps nov. sp. Of the size and general appearance of the preceding, to which it is closely allied; it differs from it in being rather brighter above and in having the disc of the hind wings almost wholly tawny instead of being so greatly encroached upon by the dusky border. Beneath paler and more of a lemon yellow, the fore wings scarcely infuscated and the hind wings uniform in tint except in having two transverse curving rows of small faint dusky spots in the same position as the darkest markings of H. Brettus. Tehuantepec.

3. H. coscinia [*Pamph. coscinia* Herr.-Schæff.]. Cuba.

4. H. Orono nov. sp. Allied to *H. Brettus*, with which it agrees in size. Upper surface with the same fulvous and brown tints, but much less in extent, occupying only the centre of the wing; sexual dash on upper surface of fore wings of male broad, composed of two similar ovoid patches, lying in the same line, closely connected, in the medio-submedian and lower median interspaces. Beneath, much as in the following species. Northern states (probably).

* 5. H. Ætna [*Hesp. Ætna* Boisd.; *Hesp. Otho* Boisd.-LeC., nec Smith-Abb.; *Hesp. Egeremet* Scudd.]. Canada to Florida; westward to Iowa. This must undoubtedly be expunged from the list of European Lepidoptera.

LIMOCHORES nov. gen.

Type HESPERIA MANATAAQUA Scudd.

† 1. L. MYSTIC [*Hesp. Mystic* Edw.]. Nova Scotia to Pennsylvania.

† 2. L. BIMACULA [*Hesp. bimacula* Grote-Rob.; *Hesp. Acanootus* Scudd.]. New England, New York.

† 3. L. MANATAAQUA [*Hesp. Manataaqua* Scudd.; *Talides vestris* Butl., nec. Boisd.]. New England to Iowa.

* 4. L. TAUMAS [*Pap. Taumas* Fabr.; *Hesp. Phocion* Fabr.; *Hesp. Themistocles* God.; *Hesp. cernes* Boisd.-LeC.; *Hesp. Arogos* Boisd.-LeC.; *Hesp. Ahaton* Harr.]. Canada to Kentucky; Massachusetts to Iowa.

5. L. ARPA [*Hesp. Arpa* Boisd.-LeC.]. Florida.

6. L. PALLAS [*Hesp. Pallas* Edw.]. Florida.

7. L. PALATKA [*Hesp. Palatka* Edw.]. Florida.

EUPHYES nov. gen.

Type HESPERIA METACOMET Harr.

* 1. E. METACOMET [*Hesp. Metacomet* Harr.; *Pamph. rurea* Edw.; ?*Hesp. Kiowah* Reak.]. Canada to Virginia; westward at least to Iowa.

2. E. VESTRIS [*Hesp. vestris* Boisd.]. California, Mendocino City (A. Agassiz).

3. E. SINGULARIS [*Gon. singularis* Herr.-Schæff.]. Cuba.

4. E. OSYKA [*Hesp. Osyka* Edw.]. South Carolina to Texas.

5. E. VERNA [*Pamph. verna* Edw.]. Connecticut to Virginia; westward to Illinois.

LERODEA nov. gen.

Type HESPERIA EUFALA Edw.

1. L. EUFALA. Florida to Texas.

2. L. FUSCA [*Hesp. fusca* Grote-Rob.]. Georgia, Florida.

3. L. INCA nov. sp. Closely allied to the preceding, which it resembles in color and uniformity; it is slightly smaller and has on the fore wings a very faint, minute pale spot, near the base of each of the median interspaces; on the middle of the outer half of the under surface of the hind wings, there is a transverse series of faint pale spots, becoming whitish in the subcostal interspaces. Peru (Henry Edwards).

PRENES nov. gen.

Type HESPERIA PANOQUIN Scudd.

1. P. PANOQUIN [*Hesp. Ophis* Edw.]. South Carolina to Key West. The locality — Connecticut — given in my previous lists, was erroneous.

2. P. OCOLA [*Hesp. Ocola* Edw.]. South Carolina to Florida.

3. P. HECEBOLUS nov. sp. Very closely allied to the preceding, but with more pointed fore wings and with the hind wings rather more produced next the tip of the submedian. It has the same markings as *P. Ocola* and in addition, upon the fore wings a small roundish transparent spot, the outline of which is not so definite as that of the others, situated just above and bordering the median nervure, midway between the origin of its first and second branches. Expanse of ♂ $38^{mm.}$ Tehuantepec.

4. P. SYLVICOLA [*Gon. sylvicola* Herr.-Schæff.] Cuba, Porto Rico.

PANSYDIA nov. gen.

Type HESPERIA MESOGRAMMA Poey.

1. P. CUNAXA [*Hesp. cunaxa* Hew.; *Hesp. Mesogramma* Poey]. Cuba.

PERICHARES nov. gen.

Type PAPILIO CORYDON Fabr.

1. P. CORYDON. Jamaica.

2. P. TRINITAD [*Eud. Trinitad* Lef.; *?Hesp. Adela* Hew.]. Cuba.

3. P. MARMORATA nov. sp. Closely allied to the preceding, the spots of the upper surface of the wings much larger; in both sexes there is a large subquadrate spot, longer than broad, reaching as far as the second divarication of the median nervure; in the middle of the upper median interspace there is a second spot, square in the male, broader than long, not extending so far inward in the female; in the lower median interspace is a larger one, quadrate, except in having the lower outer angle produced outward, longer than broad, its inner limits reaching beyond the origin of the second median nervure in the female, of about half the size in the male, to make room for the sexual dash, which is less curved than in the preceding species; in the lower half of the medio-submedian interspace, there is a quadrate spot, twice as long as broad, reaching the

sexual dash (♂) or smaller, strongly crescentic, and, in addition, a squarish spot in the upper half of the interspace beneath the outer half of the spot in the interspace above (♀); under surface much as in *P. Trinitad.* Expanse $60^{mm.}$ Venezuela.

4. P. SANDARAC [*Gon. Sandarac* Herr.-Schæff.]. Cuba.

CALPODES Hübn. (1816).

Type PAPILIO ETHLIUS Cram.

1. C. ETHLIUS [*Hesp. Chemnis* Fabr.; *Eud. Olynthus* Boisd.-LeC.]. New York to Brazil.

OLIGORIA nov. gen.

Type HESPERIA MACULATA Edw.

1. O. MACULATA. Florida.

CYMÆNES nov. gen.

Type COBALUS TRIPUNCTUS Herr.-Schæff.

1. C. TRIPUNCTUS. Cuba.
2. C. MALITIOSA [*Gon. malitiosa* Herr.-Schæff.]. Cuba.

LEREMA nov. gen.

Type PAPILIO ACCIUS Smith-Abb.

1. L. ACCIUS [*Hesp. Monoco* Scudd.; *Hesp. Nortonii* Edw.; *Hesp. punctella* Grote-Rob.]. Connecticut to Louisiana.

† 2. L. HIANNA [*Hesp. Hianna* Scudd.] New England, New York.

3. L. PATTENII nov. sp. Closely resembling *L. accius* but smaller and with proportionally smaller spots, the sexual dash on the upper surface of the fore wings of the male, sinuous instead of arcuate, and with the lilac tints of the apex of fore wings beneath sharply defined against the maroon patch of the costal border; fringe of fore wings slightly duskier at the nervule tips. Expanse ♂ $33^{mm.}$ Guatemala.

MEGATHYMUS nov. gen.

Type EUDRYAS YUCCÆ Boisd.-LeC.

1. M. YUCCÆ. Georgia, Texas (Capt. Pope, Mexican Boundary Survey).

I have either not been able to examine, or to determine, the following species: *Eud. cellus* Boisd.-LeC.; *Nison. costalis* Westw.; *Hesp. Ridingsii* Reak.; *H. Garita* Reak.; *H. Procris* Edw.; *H. Eos* Edw.; *H. Horus* Edw.; *H. Allatus* Edw.; *H. Pontiac* Edw.; *H. Draco* Edw.; *H. Licinus* Edw.; *H. Buleuta* Boisd.-LeC.; *H ruricola* Boisd.; *H. pratinicola* Boisd.; *H. sylvanoides* Boisd.; *Pap. Otho* Smith-Abb.

New American Moths; Zygænidæ and Bombycidæ. By A. S. Packard, Jr.

Many of the species here described were received from the Museum of the Department of Agriculture, at Washington, through Mr. Townend Glover; while most of the Californian and one New Mexican species are from the collection of Mr. Henry Edwards of San Francisco.

ZYGÆNIDÆ.

Lycomorpha miniata, n. sp. 1 ♂, 5 ♀. Black and vermilion red. Of the same size as *L. Pholus* and agreeing with it structurally. Body, legs and outer halves of wings deep blue-black; patagia and base of both wings deep vermilion. Hind wings more of a rose red than the fore wings. On the fore wings the outer edge of the red portion irregular, being excavated and pointed on the median vein just as in *L. Pholus*. Under side of body like the upper. In one rubbed ♂ the base of the fore wings is of a yellowish tint.

Length of fore wing, ♂, .52; ♀, .60; of body, ♂, .40 inch.

Southern California (Department of Agriculture).

L. Palmerii, n. sp. 2 ♀. Head and abdomen dark brown. Thorax and fore wings and basal half of hind wings, pale brick red. Fore wings uniformly pale brick red, slightly paler on the costa; extreme edge of wing next to fringe, deep Prussian blue; fringe brownish and concolorous with the outer half of the hind wings; the red portion extends nearer to the apex of the wing than in *L. Pholus* or *L. miniata*. Under side of both wings as above.

♀. Length of fore wing, .55–.60; body, .40 inch.

Arizona (Dr. Palmer, Depart. Agric.).

BOMBYCIDÆ.

Cisthene grisea, n. sp. 1 ♂, 2 ♀. Pale gray. Body pale glistening gray, antennæ, palpi and head concolorous; the hind wings being of the same pale, whitish gray hue. Fore wings uniformly stone gray, rather darker than the body; the only mark being a large broad triangular white spot, edged with black, situated on the hind edge, just beyond the middle of the wing, the apex of the triangle rests usually on the discal veins, but in one ♂ and one ♀ it forms an hour-glass-like band extending to the costa and contracted in the middle. Base of wing whitish below the submedian vein. Hind wings whitish, or pale gray or with a faint yellowish tinge, the apex of the wing is either clouded broadly with dark gray, concolorous with the fore wings, or varies in being very slightly tinged at the extreme tip. Beneath marked as above, but with the whitish band on fore wings, obsolete or nearly so.

Length of fore wing, ♂, .35–.40; ♀, .45; body, ♂, .25–.30; ♀, .30 inch.

California (H. Edwards).

Differs from the eastern species by its dull gray color.

Clemensia umbrata, n. sp. 1 ♂. White, with a grayish tinge. Head white with a few scattered gray scales. Palpi whitish, lined with blackish inside, and tipped slightly with black. An irregular, interrupted, wavy, slightly curved line crosses the inner third of the wing, being most distinct on the subcostal and median vein. A broad dark band crosses the outer third of the wing, being broadest in the middle of the wing, where it is as wide as the wing itself on the basal third: its edges are very irregular; it encloses an inner and a much larger outer discal black dot. Edge of wing with a marginal row of indistinct spots. Hind wings pale gray. Beneath pale gray, fore wings a little darker than hind wings, the bands and spots obsolete.

Length of fore wing, .40; of body, .25 inch.

California (H. Edwards).

Differs from the eastern *C. albata* in the broad shade crossing the fore wings, while the general hue is duller, almost gray white; and the hind wings are grayish, while those of *albata* are white.

Nemeophila petrosa Walker. Cat. Lep. Het. Br. Mus. iii, p. 626. Our specimens agree throughout with Walker's description, though no two specimens are just alike. Two males from southern California differ from each other; one marked like *N. plantaginis* of Europe, has white bands, tinged with yellowish on the fore wings, and the hind wings are white, with a broad irregular dark band just within the middle, the outer edge of the white portion twice deeply incised. In the other specimen (which agrees with Grote's figure of *Eupsychoma geometrica*, from Colorado Territory, Proc. Ent. Soc. p. 318. 1865, pl. 2, fig. 1, so that I am inclined to believe that these two species are identical) the bands and spot on the fore wings are yellowish, and the hind wings are uniformly dark brown, with a small yellowish spot near the inner angle. The two females are more uniform, and in one specimen there are two yellowish spots on the hind wings. The antennæ are wanting in all the specimens. Walker's specimens came from the "Rocky Mountains."

Four examples from the Museum of the Department of Agriculture.

Platarctia Scudderii Pack., as I have long suspected, is a Nemeophila and closely allied to *N. petrosa*, the anal claspers of the ♂ being much like those of the latter.

Leucarctia acræa (Smith). On comparing several specimens from California, received from Mr. Henry Edwards, I find that my *L. Californica* does not vary from our New England individuals. I suspect that on further comparison *Pyrrharctia Californica* will prove to be the same as the eastern *P. Isabella*.

Leucarctia permaculata, n. sp. One ♀. Closely allied in structure to *Leucarctia acræa*. White. Head white, orbits and upper side of palpi brown. Two brown spots on prothorax, a round brown spot at base, and a broad streak in the middle of each patagium. Both wings white, fore wings thickly spotted with large brown spots, arranged in five rows. A round costal dot at base. Basal line bent at right angles on the median vein, consisting of six spots. Second row forked on the median vein, consisting of seven spots and three discal spots, the two larger spots being separated by the discal veins. The third row consisting of nine spots, is bent in the first median interspace. The fourth and submarginal row is parallel to the outer edge; it is slightly sinuate, consisting of eight spots. Marginal and fifth row reaches to the fringe and with smaller spots than in the other rows. Hind wings white, with a discal squarish dot, divided by the discal veins, five costal spots, the inner two within the middle of the costa, middle two just over the costa, and outer one belonging to the marginal row of dots six in number, quite small and narrow. All the markings appear beneath. Abdomen white, yellow from second to sixth ring, tip white, a dorsal row of transverse brown bands. A double lateral row, and a row of rather large ventral dark spots.

Length of fore wing, .80; body, .70 inch.

Southern California (Depart. Agric.).

This species while smaller, also differs from *L. Californica* in the spotted thorax, the large and numerous spots on fore wings, which those in *L. acræa* never approach in size and number, and the legs are marked very differently, there being no yellow scales, and the large femora and tibiæ being black externally, white within; the smoky band on each side of the eyes, on the under side of the head, like a pair of mustachios, is very large and prominent, there being none or only small ones in *Californica.* Palpi black at tip, white at base instead of yellow as in the other species, though one *L. acræa* from California, is white instead of yellow as usual.

Halesidota caryæ (Harr.). A specimen collected by Dr. Palmer, on the "border between Arizona and New Mexico," and in the Museum of the Department of Agriculture, differs from seven New England individuals in being a little darker on the fore wings, and in having a less number of silvery spots in the 2d, 3d and 4th rows. The outer or marginal row is the same, but the 7th or apical spot is much smaller. But these differences are of slight importance and do not indicate even a variety.

Drepana siculifer, n. sp. One ♀. It differs from *D. fabula* Grote, which it very closely resembles, in being much paler, almost whitish. The wavy scalloped lines are more diffuse, and the 2d and 3d lines are much nearer together and unite below the median vein to form a ringlet. The oblique line beyond is broader and more distinct, and the marginal line is more wavy. Fringe dark brown. Hind wings with the 2d and 3d lines forming ringlets as on the fore wings. Beneath, the lines and spots are very distinct, when in *D. fabula* they are almost obsolete; the curved diffuse dusky line just beyond the discal dots is very distinct, ending and dilating on the origin of the first three median venules.

Length of fore wing, .50; of body, .80 inch. California (Edwards).

Hemileuca Juno, n. sp. Two ♂, one ♀. Similar in its form to *H. Maia*, but without the white band on the hind wings. Antennæ reddish; pectinations darker. Body dark brown; reddish hairs on under side of head and base of legs, not so dark, however, as in *H. Maia.* Hairs on prothorax whitish, those on metathorax forming a transverse band of a deeper red than on end of abdomen. Scattered gray hairs on the thorax. Both wings uniformly dark brown; fore wings crossed by a broad diffuse white band, broken up into intervenular spots; it widens on the subcostal region touching the costal end of the discal spot and does not reach the costa. Discal spot hyaline, regularly crescent-shaped. Hind wings with a few white scales beyond the discal spot, the latter minute, obscure and surrounded with a roundish, blackish cloud. Beneath, the whitish band appears most distinct towards the costa. On hind wings there is a round white patch beyond the discal dot, and another between it and the costa. Discal dot more distinct than above on both wings, especially the hind pair and forming a white dot with a straight hair-line running through it, while the round dark cloud enclosing it is more distinct than above. Abdomen clothed above with dull reddish hairs, with brighter red hairs on the three terminal rings.

Length of fore wing, ♂, 1.15; ♀, 1.25; of body, ♂, .85; ♀, 1.05 inches.

Border of Arizona and Sonora (Dr. Edward Palmer).

H. Hera is said by Harris to be yellow, and seems to be a larger species than *H. Juno.*

Coloradia Pandora Blake. One much broken specimen of this fine moth was collected by Dr. E. Palmer on the "Border of Arizona and New Mexico." (Depart. Agriculture.)

EULEUCOPHÆUS, nov. gen.

This is a singular genus closely allied to *Hemileuca*, especially the section represented by *H. Juno*, with which the present genus may be compared. The body, including the antennæ, is large, while the wings are much smaller than usual. The antennæ are large, broadly pectinated to the tip, just as in *Hemileuca*, and the body is of the same structure and size as in *H. Juno.* The fore wings are much as in *H. Juno*, but proportionately smaller, the costa being slightly sinuate, incurved in the middle, the apex being much rounded just as in *H. Juno*, and the outer and inner edges having also the same proportions. The hind wings are much shorter and rounder than in *Hemileuca*, the tip of the abdomen projecting considerably beyond them; the apex is much more rounded. The venation differs in the second median venule arising from within the middle of the wing, especially in the hind wings; in *H. Juno* it arises outside the middle of the wing. The style of coloration is quite different, there being no discal spot on the hind wings, which are pale whitish yellow (testaceous).

The generic name is given in allusion to the pale gray color so unusual in this subfamily.

E. tricolor, n. sp. Head beneath, thorax beneath, and dorsal half of the abdomen dull brick red; top of thorax grayish brown. Antennæ pale testaceous, with a reddish tinge. Fore wings of a faded testaceous white, the hind wings being concolorous; wings clouded at base with gray; a mesial broad grayish brown band occupying the middle third of the wing; a little broader on the costa than the hind edge; a little darker on the inner edge enclosing the white irregular lunate discal spot. A diffuse marginal band, scarcely reaching the apex. Hind wings uniform, faded whitish, testaceous with faintly carneous veins; no discal dot. Beneath whitish; bands on the fore wings very faintly seen; a faint carneous tinge along the basal half of the costa and a reddish tinge on the base of the hind wings.

Length of fore wing, .90; body, .90 inch.

One specimen from New Mexico, from the collection of Mr. Henry Edwards.

Whether the unusually pale color of this species is to adapt it for concealment in desert and dry localities, or not, we can only learn when we know something of the habits of the moth.

GLOVERIA, nov. gen.

♀. Head nearly as large as Lasiocampa. Eyes a little smaller, front broad between the eyes. Antennæ much as in Lasiocampa, but the pectinations about three times as long as the joints from which they arise and pectinated to the tip. Palpi unusually small, short, ends rather blunt, not reaching the front, a little depressed. Body stout. Wings unusually long and narrow. Fore wings long; costa well curved beyond the middle. Apex rather produced, subacute; outer edge unusually oblique, of about the same length as the inner. Hind wings long, very obtuse and much rounded at the apex, when expanded not reaching to the tip of abdomen. Venation much as in Lasiocampa, but interspaces much longer, owing to greater length of wing. Discal venules situated on inner third of wing, the discal space being unusually small, and discal spot forming a mere dot. Costa of hind wings and venation similar to Lasiocampa, but the base of costa is much less convex. Legs large and stout but less hairy and the body much less woolly than in Lasiocampa.

This remarkable genus is the type of a separate section of the Lachneides (Lasiocampadæ of Duponchel) from Gastropacha and Clisiocampa, but for want of material I have been obliged to compare it with Lasiocampa alone. That it belongs, however, to this subfamily, is evidenced by the form and peculiar squamation of antennæ, form of head and venation, so well marked in this group, and form of costa of hind wings.

This is one of the most interesting additions to our lepidopterous fauna for some years, and it is dedicated to Mr. Townend Glover in recognition of his eminent services to economical entomology.

G. Arizonensis, n. sp. One ♀. Ash gray, the front a neutral tint, being mouse colored. Body mouse colored, with pale gray hairs on the thorax above and beneath. Fore wings ash gray, the whitish scales and hairs predominating over the mouse colored ones, basal quarter of wing with longer whitish hairs than elsewhere on the wing, and reaching to the small white discal dot, which is surrounded by a dark discoloration. Half way between the discal dot and the outer zigzag line is a faint brown line, going straight in its course from the middle of the inner edge where it is most distinct, obliquely upwards and parallel to the outer edge of the wing and disappearing on the third subcostal vein. Perhaps the mouse colored, oblique subapical discoloration, which extends from second subcostal vein to the costa, is the termination of the line. An outer, well marked, submarginal, very zigzag, brown line, the points between the venules being acute and nearly twice as long as the intervenular spaces themselves; the points are filled with whitish hairs; the line becomes obsolete towards the costa, and consists of nine scallops. The margin of the wing beyond this line is covered with finer scales, being the color of pepper and salt. Fringe brown, interrupted by small white dots at ends of venules. Hind wings pure mouse color, rather hairy at base, with no discal spots or other markings; with scattered light scales along the margin. Abdomen concolorous with the hind wings. Under side of both wings concolorous with the hind wing above, but rather paler owing to numerous gray scales. No markings present; middle of fore wing without gray scales. One perfectly preserved specimen.

Length of fore wing, 1.75; whole expanse, 3.70. Length of body, 1.35 inches.

Border of Arizona and New Mexico (Dr. Palmer, Dept. Agriculture).

It is more nearly allied to *Gastropacha? Otus* (Drury) Westwood's edit. ("*Bombyx Agrius*, Olivier Encyc. Meth., 5, 39, 56," Westw.), from Smyrna, than any moth with which I am acquainted. It agrees closely in the general form of the body and wings with the same style of markings. That is a ♂, while *Gloveria Arizonensis* is a ♀ and differs in the longer and more rounded hind wings, the body not extending so far beyond the wings as in *G? Otus*.

Gastropacha Californica, n. sp. One ♂. Pale ash gray with scarcely a hint of ferruginous, and frosted somewhat, especially on the outer edge of the wings. Head, palpi and eyes smaller than in *G. Americana*, of the same reddish brown color. Fore wing pale ash, hoary beyond outer line. Two inner and outer lines consisting of dark intervenular spots, arranged much as in *G. Americana*. The discal space between the inner and middle lines is hoary, and bounded externally by a distinct dark discal dot. The costal region becomes slightly tinged with reddish toward the apex. Hind wings pale, crossed by two brown shades, the outer band broad and diffuse, paler between the bands than elsewhere. Fringe reddish brown, interrupted between the points of the scallops with silvery. Beneath, pale ash, with long woolly hairs at base of fore wing. Costal region brown towards apex. Venule brownish. Middle of hind wing, especially towards basal notch on costa brownish, a faint outer band disappearing before reaching the inner edge.

Length of fore wing, .75. Abdomen wanting.

Though the antennæ and abdomen are wanting, I venture to describe it from a single specimen otherwise in excellent condition. It is of the same size as *G. Americana*, but differs in the smaller head, and especially the smaller palpi, the frosted pale ash wings, the hoary discal space and the broad diffuse brown bands on the outer half of hind wings.

"South California" (Dept. Agriculture).

LIST OF THE COLEOPTERA COLLECTED IN LABRADOR. BY A. S. PACKARD, JR.

THE collection of Coleoptera of which a list is here given from specimens kindly identified by Dr. G. H. HORN (with a few identified by Dr. Leconte from Caribou Is.), was made, in the summers of 1860 and 1864, along the coast of Labrador from Caribou Island, mouth of the Esquimaux River, Straits of Belle Isle, to Hopedale, the southernmost Moravian Mission station. The entire collection is in the Museum of the Peabody Academy of Science.

Family CARABIDÆ.

Notiophilus Sibiricus Motsch. Found running under herbage at Domino Harbor, on a dry hillside. Also at Square Island early in July, under grass in soil by a brook. There is a specimen in the museum of the Academy from the summit of Mt. Washington, N. H.

Nebria Sahlbergii Fischer, Sloop Harbor.

Carabus Chamissonis Fischer. A specimen from Domino Harbor, and another from Okak, collected by Rev. Samuel Weiz.

Calathus ingratus Dej. Whole coast.

Platynus sinuatus Dej. Belles Amoures, June 20, Straits of Belle Isle, June 20.

Pterostichus adstrictus Esch., var. *orinomum* Kirby. Mecatina; Gulf St. Lawrence, June 15.

Pt., species not determined. Hopedale. Tinker Island, off Cape Harrison. (Cape Webuc.) Under stones, July 21.

Amara obtusa Lec. Not common.

A. hæmatopus Kirby. Sloop Harbor, August. Hopedale, Okak (S. Weiz).

A. similis Lec. (*Stereocerus similis* Kirby) Caribou Is.

Amara "no name." Strawberry Harbor, Square Island, Hopedale.

Amara near *A. melanogastrica* Esch., perhaps *A. brunnipennis* Dej. Caribou Island.

Harpalus herbivagus Say, var. *proximus* Lec., Square Island.

Patrobus tenuis Lec. Square Island.

P. hyperboreus Dejean. Belles Amoures. Straits of Belle Isle, June 20.

Trechus micans Lec. Belles Amoures, June 20.

Family NITIDULIDÆ.

Ips sanguinolentus Oliv. Caribou Island.

Family CRYPTOPHAGIDÆ.

Atomaria not determined. Caribou Island.

Family BYRRHIDÆ.

Byrrhus Americanus Lec. Caribou Island.
B. Kirbyi Lec. (*B. picipes*). Caribou Island.

Family ELATERIDÆ.

Cryptohypnus bicolor Germ. Common at Belles Amoures. Strawberry Harbor and Indian Harbor.

Eanus vagus Lec. Square Island, July 12.

E. pictus (Cand.) Horn (*E. maculipennis* Lec.) Very abundant along whole coast from Caribou Island to Square Island, July and August.

Sericosomus incongruus Lec. Square Island, July 12.

Family TELEPHORIDÆ.

Podabrus mandibularis Kirby. Caribou Island.
P. lævicollis Kirby. Hopedale.
Telephorus fraxini Say. Hopedale.

Family CURCULIONIDÆ.

One weevil allied to Pissodes was found at Hopedale.

Family CERAMBYCIDÆ.

Argaleus nitens Lec. This species was taken on the vessel, Aug. 6th, near Cape Harrison.

Criocephalus obsoletus Randall. Okak (Weiz.).

Leptura n. sp. Caribou Island.

Family COCCINELLIDÆ.

Coccinella lacustris Lec. Okak. (Weiz.)

Family DYTISCIDÆ.

Hydroporus catascopium Say. Square Island, July 4, and Dumplin Harbor.

H. puberulus Lec. Sloop Harbor and Dumplin Harbor. Common.

H. tenebrosus Lec. Caribou Island.

Agabus parallelus Lec. Square Island, July 12.

A. discolor Lec. Indian Harbor.

A. punctulatus Aubé. Caribou Island.

A. lævidorsus Lec. " "

A. semipunctatus (Kirby) " "

A. subfasciatus Lec. " "

A. ambiguus Lec. (*A. infuscatus* Aubé.) Caribou Island.

Colymbetes picipes Kirby. Caribou Island. Strawberry Harbor.

C. sculptilis Harris. Caribou Island. Square Island. Hopedale.

C. binotatus Harris (probably).

C. nov. sp? Square Island.

Family GYRINIDÆ.

Gyrinus picipes Aubé. Abundant at Square Island, early in July.

G. affinis Aubé? Square Island.

G. minutus Linn. Square Island.

Family HYDROPHILIDÆ.

Philhydrus bifidus Lec. Caribou Island.

Family SILPHIDÆ.

Silpha Lapponica Linn. Whole coast from Caribou Island to Hopedale. Abundant.

Agathidium obsoletum Lec. Square Island.

Family STAPHYLINIDÆ.

Creophilus villosus Gray. Caribou Island.

Tachyporus n. sp. Hopedale.

Bledius not determined.

Two other species of this family were also collected.

LIST OF ADDITIONS TO THE MUSEUM DURING THE YEAR 1871.

Abbott, Dr. C. C., Trenton, N. J. A fine stone knife from Norway; also a large collection of Stone Implements from New Jersey.

Alden, Dr. U. S. A., Ft. Gratiot, Mich. A small collection of Fishes and specimens of Colorado Potato Beetle from vicinity of Fort Gratiot.

Allen, J. F., Salem. Insects from Conway, N. H. Ores from Madison, N. H., containing Tin, Silver and Lead.

Angus, James, West Farms, N. Y. Vespa crabro from that locality.

Archer, A. J., Salem. Specimen of Cicada rimosa.

Atkins, C. J., Augusta, Maine. Three fresh specimens of Salmon from the Penobscot.

Austin, Geo. F. Stone Skin Dresser from Louisiana.

Barton, W. G., Salem. A collection of Butterflies and Moths from Salem.

Behrens, J., San Francisco. A collection of Noctuidæ, Phalænidæ and other Insects from California.

Belfrage, G. W., Texas. Specimens of Streptocephalus, Estheria and Galcodes from Texas. Fishes from Texas.

Bolles, Rev. E. C., Salem. Mantis sp. from Salem, and other insects from various localities. Also Cecidomyia Galls on Grapes.

Briggs, C. C., Salem. Nest of Humming Bird from North Salem.

Briggs, J. F. Minerals from Diamond Coal Mines, Pennsylvania.

Brookhouse, R., Salem. Dress from interior of Africa, via Loanda, West Coast of Africa.

By Purchase. A named collection of Plants, 185 sp., principally American Carices.

Byrkit, John, Indianapolis, Ind. Fishes, Reptiles, Insects, etc., from vicinity of Indianapolis, Ind.

Carlen, S., Salem. Skulls and Skeleton of Rabbits. Also various Mammals and Birds from this locality.

Clark, W. S., Agricultural College, Amherst. Coccus from a pine tree.

Cloutman, W. R., Charleston, S. C. Spanish Moss from that vicinity.

Coe, C. C., Charleston, S. C. Fossil Bones and Shells from Stone River, S. C.

Cooke, C., Salem. Parasites from various Mammals and Birds. Myriopoda, Beetles, Phalangopsis, Diptera, and Crustaceans from the Mammoth Cave, Ky.

Corbin, Mrs. D. T., Charleston, S. C. Shark's Teeth from Stone River, S. C.

Cox, Prof. E. T., Indianapolis, Ind. Specimens of Block Coal from Clay Co., Ind. Fishes from Indiana. Cambarus pellucidus from the Mammoth Cave, Ky.

Curtis, Dr. Josiah, Knoxville, Tenn. Specimens of Lepisma n. sp., and singular Cocoon from Knoxville. Machilis and Poduræ from Knoxville, Tenn. Specimens of Helices from Knoxville.

Dix, Miss D. L., Washington, D. C. Specimen of Lipura from a Wardian case. Aquatic plants from Taunton river at Taunton, Mass.

Dodge, A. W., Hamilton. Stone Skindresser.

Edwards, Henry, San Francisco, California. A collection of Insects, mostly Moths, from California, and a few from Australia. Also a few Crustacea from San Francisco, Cal. Reptiles from the vicinity of San Francisco, Cal.

Farlow, Dr. W. G., Cambridge. A collection of Algæ from Wood's Hole, collected by Dr. Farlow. Also a collection of Algæ from Cuba collected by C. Wright.

Fenimore, G. W., Philadelphia, Penn. Stalactites and Stalagmites from Cave of Belamar, Matanzas, Cuba.

Fish, W. C., East Falmouth, Mass. Insects from vicinity of Falmouth. Spiders and Lice from Snowy Owl.

Fowler, Miss M. S., Danversport, Mass. Sphinx Larva attacked by Microgaster.

Fuller, Capt. Specimens of Echineis from the Atlantic Ocean, and a painting of the Chincha Islands.

Fuller, Enos, of Topsfield, Mass. Insects from Topsfield.

Gilkie, Oliver, Indianapolis, Ind. Fishes from White River, Eagle Creek, and other localities about Indianapolis.

Gillan, Miss Annie P., Salem. Model of a Gondola.

Glover, F. Insects from the borders of Arizona and Sonora.

Grote, A. R., Demopolis, Ala. Type specimens of Acidalia persimilata, A. purpurissata, Callidateryx dryopterata, Botys plumbicostatis, B. anticostatis, B. plectilis, B. laticlavia, etc., from Alabama and Penn. A collection of Insects from New York. A collection of moths containing type specimens of several species from Alabama.

Goodale, S. L., Brunswick, Me. Erisoma lanigera on apple twig from Baton Rouge, La.

Goodhue, W. W., Salem. Reptiles, Insects and other specimens from Zanzibar.

Gould, J., Ipswich. Indian Implements from Ipswich.

Hervey, Rev. A. B., Peabody. Coleoptera from Bradford, N. H.

Hill, Benj., Salem. Larva of Papilio Turnus, Limax sp., from Salem.

Holleman, Lt. Junius, Ft. Bidwell, Cal. Collection of Insects from Goose Lake, Siskiyon Co., California. Boreus Californicus and other Insects from Ft. Bidwell, Cal.

Harford, W. G., San Francisco. A collection of Hymenoptera and Moths from Santa Barbara, Cal.

Hoy, Dr. P. R., Racine, Wis. Mysis, sp., Gammarus Hoyi and a Leech from White Fish from Lake Michigan. Amblystoma lurida in various stages of development.

Hubon, H., Salem. Platysamia Cecropia from Salem.

Hubon, H. A., Salem. Cecropia Polyphemus from Salem.

Hyatt, Prof. A., Salem. Worms from Wood's Hole, Mass.

Jenkins, C. T., Salem. Fossil wood from You Bet, Nevada Co., California.

Jewett, W. F., Salem. Larva of Sphinx from Salem.

Johnson, Dr. A. H., Salem. Specimen of Callinectis hastata found in a load of Oysters from the South.

Johnson, F. D., Salem. Prionis laticolis from Salem.

Kimball, James, Salem. Sponge from Beverly Harbor. Seed vessels from India.

Krug, L. Collection of Butterflies from Porto Rico.

Knapp, Dr. James, Louisville, Ky. Fossil Coral from the vicinity of Louisville.

Levette, Dr. G. M., Indianapolis, Ind. Fishes, Insects, Crustaceans, etc., from various localities near Indianapolis.

Leavitt, James. Tachina virida from Salem.

Lefabre, John, Salem. Canker worms from this vicinity.

Lock, N. C., Salem. Black Squirrel from Lockport, N. Y.

Lovett, J., Beverly. Pipes and other Indian implements dug up in Beverly, Mass.

Luscomb, J. Warren, Salem. Fishes and Crustaceans from Muscat, Zanzibar and other localities. Bat from Zanzibar. Model of a boat from Point de Galle.

Lyon, S. S., New Albany, Ind. A valuable collection of Fossils from New Albany, Ind.

Mack, Miss H. O., Salem. Cerambycid and other larvæ, found boring and killing Austrian Pines. Larva of Scenopinus pallipes from under a carpet.

Maguire, Thomas, Gloucester, Mass. Unios from the Mississippi at Lansing.

Mansfield, Geo., Salem. Larva of Thyreus Abbotii from Salem.

Maynard, C. J. Ipswich. Reptiles, Fishes, Insects, Crustaceans, etc., in alcohol and dry, from Florida and other localities. Asterias in the skull of a Skate.

McNiel, J. A. A collection of Minerals and Zoological specimens from Central America and other localities.

Metcalf, Chas. A., Salem. A Black Hawk, Archibuteo Sancti Johannis, from Salem.

Millett, Nathan, Salem. Fossils from Davenport, Iowa.

Morgan, Edward A., Salem. A fine specimen of Black Hawk, Archibuteo Sancti Johannis, shot at Cold Spring, North Salem, Nov. 15, 1871.

Museum of Comparative Zoology, Cambridge, Mass. Two specimens of Apus Himalayanus from the Himalaya Mts., India.

Olmstead, J. Nest of Vespa crabro from Morristown, N. J.

Ordway, Gen. Albert, Richmond, Va. A collection of Minerals from near Richmond.

Osgood, Alfred, Newburyport, Mass. Arrowheads and a Triangular Stone found at Newburyport.

Osborne, Chas., Salem. Two Bird Skins from South America.

Packard, A. S., Jr., Salem. Fossil Bones and Shells from the Phosphate beds of North Carolina. Crustaceans and Insects from Charlestown, N. C. Worms, Crustacea, etc., from Wood's Hole, Mass. Insects dry and in alcohol from Orono, Me.

Patch, B. W., Hamilton. Sharp shinned Hawk and larva of Saperda calcarata from Hamilton.

Peabody, J. P., Salem. Lichens from Boxford, Mass.

Pettingell, Mr., Salem. Specimens of Barnacles from the Grand Banks.

Phippen, Geo. D., Salem. Minerals from various localities.

Pond, E. B., Salem. Diapheromera femorata from Salem.

Putnam, Mrs. Eben, Salem. Ceratomia quadricornis from Salem.

Putnam, F. W. Cecidomyia Galls on grapes. Larva and pupa of Pieris rapæ.

Putnam, Capt. W. H. A., Salem. Three Japanese Pocket Handkerchiefs.

Ravenel, Dr. H. W., Aiken, S. C. Small collection of Moths and Butterflies from S. Carolina.

Ricker, Mrs., Salem. Cone of the Sugar Pine from Sharon Valley, Yuba Co., California.

Rider, J. J., Salem. Disintegrated Stone from St. Vincent.

Ridings, James, Philadelphia. A collection of Phalænidæ from Colorado.

Roberts, David, Salem. Gorgonia species from ?

Robinson, John, Salem. Aphis parasitized by Aphidius.

Ropes, W. H., Salem. Four specimens of Limulus polyphemus from Salem, and insects from Salem.

Russell, J. L., Salem. Flower of Agave Americana from Philadelphia. Seeds of Nyssa multiflora taken from the cheek pouches of Tamias striatus. Acorns of Quercus species from near Mercede River, Nevada.

Samuels, E., Milton. Dipterous larvæ mounted for the microscope.

Shimer, H., Mt. Carroll, Ill. Insects from Mt. Carroll, Ill.

Stevens, C. K. Honey cells of Melipona from log of Mahogany from Honduras.

Stodder, Simon. Specimens of Asbestos from New Jersey.

Stone, Miss Mary, Salem. Insects from Salem.

Street, W., East Hampton. Stereoscopic picture of a Duck Hawk and Eggs.

Taylor, J. E., Charleston, S. C. Fossil Bones and Shells from Stone River, S. C.

Tenney, E. P. Diapheromera femorata from Fairlee, Vt.

THOMPSON, WALDO, Swampscott, Mass. Malformed Eggs of Common Fowl, and specimen of Vanessa hatched in February.

TINKHAM, ANDREW, Monmouth, Me. A piece of Wood gnawed by Beavers found four feet below the surface at Winthrop, Me.

TUCKER, HORACE, Chicago, Ill. Sheets of Tin melted together at the Chicago fire.

TUCKER, JONATHAN. Papilio Asterias from Salem. Tremex Columba, from Salem. A Chinese Comb.

TUTTLE, JESSIE C., Salem. Salamander from Salem.

UPHAM, W. P., Salem. Specimen of Lycosa.

UPTON, Capt. JOSEPH, Salem. Reptiles, Fishes, Insects, etc., in alcohol, from the West Indies.

VERRILL, Prof. A. E., New Haven, Conn. Crustacea from Wood's Hole, Mass.

VERRY, FRANK W. A collection of Moths from Dedham, Mass.

WALKER, C. A., Chelsea, Mass. Insects from Salem and various other places.

WALTON, E. N., Salem. A piece of the Sill of a House 17 years old, eaten out by White Ants.

WARD, Mrs. JAMES, Salem. Minerals, etc., from various localities.

WATERS, D. P., Salem. Mammals, Birds and Insects from Salem.

WHEATLAND, Miss MARTHA, Salem. Shells, Minerals, etc., from various localities.

WHITTREDGE, JOHN, Hamilton, Mass. A collection of several Stone Implements from Hamilton.

WILLIS, A. B., Salem. Nest of Humming Bird from Salem.

WOOD, WM. K., West Newton. Living specimen of Cistuda Carolina.

WYMAN, Prof. J., Cambridge, Mass. A piece of Branch of Tree cut off by Oncideres, probably, and Galls on Live Oak from Florida.

C. COOKE, *Assistant.*

PEABODY ACAD. SCIENCE.
Dec. 31st, 1871.

RECORD

OF

AMERICAN ENTOMOLOGY,

FOR THE YEAR 1871.

EDITED BY

A. S. PACKARD, JR.

SALEM, MASS.
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1872.

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*In this and other groups the editor has been materially assisted by Messrs. F. W. Putnam, Edward Norton, C. V. Riley, and F. G. Sanborn. Also in recording species described in foreign journals he is greatly indebted to the "Zoological Record," and Dr. Brauer's "Bericht." With the aid of these works he has been able to add references to species found in all that portion of the American continent north of and including the Isthmus of Panama. When the species were described previous to 1871 the dates are given.

RECORD OF AMERICAN ENTOMOLOGY

FOR THE YEAR 1871.

HYMENOPTERA.

G. J. Bowles (Canadian Entomologist, iii, 7). Notes on *Nematus*.

W. Saunders (Can. Ent., iii, 25). Hints to Fruit Growers.

E. B. Reed (Can. Ent., iii, 210). Notes on *Megachile*.

P. S. Sprague (Can. Ent., iii, 235). Parasite on *Pieris rapæ*.

F. Walker (Trans. Ent. Soc., London, 1869, 313). Notes on Chalcididæ and description of a new species of *Megastigmus*.

F. Walker. Notes on Chalcidiæ. (London.)

W. LeBaron. First Annual Report on the Noxious Insects of the State of Illinois.

C. V. Riley. Third Annual Report on the Noxious, Beneficial, and other Insects of the State of Missouri.

A. S. Packard, Jr. (Amer. Naturalist, Vol. V). The Early Stages of Ichneumon Parasites, a review of Ganin's embryology of Platygaster, Polynema, Teleas, and Ophioneurus. Packard thinks that the facts discovered by Ganin bear strongly on Cope and Hyatt's theory of "acceleration and retardation," and considers that the ancestry of the insects should be traced directly to the worms and not the crustacea.

A. S. Packard, Jr. First Annual Report on the Injurious and Beneficial Insects of Massachusetts.

Charles A. Blake (Trans. Amer. Ent. Soc., pp. 217–263). Synopsis of the Mutillidæ of North America.

Gustav Mayr (Verh. Zool. bot. Ges., Vienna, Dec., 1870). Describes twenty-six new species of North American Ants.

Henri de Saussure (Rev. et Mag. Zool., Paris). Describes twenty-six new species of North American Solitary Wasps.

A. E. **Holmgren** (Kongl. Svenska Fregatten Eugenies Resa omkring Jorden. Zoologi; 1. Insecta Hym., pp. 391–442. Stockholm, 1868) gives descriptions of several new species of North American Hymenoptera.

E. **Taschenberg** (Giebel's Zeitschrift f. gesammt. Naturwissenschaften, Bd., 34, p. 407, 1869). Die Sphegiden des Zoologischen Museums der Universität in Halle. In this paper several American species are described as new.

APIDÆ.

E. H. T. (Amer. Nat. iv, 689) has observed that Bombi enter the corolla of Salvia and fertilize the flower.

E. B. **Reed** (Can. Ent., iii, 210) notices (with a figure) the habit of *Megachile brevis* Say, in making its cells by rolling up the leaves of a tree.

VESPIDÆ.

Henri de Saussure (Rev. et Mag. de Zool. Paris, 1871) describes as new *Odynerus* (*Symmorphus*) *debilis*, *O. Walshianus*, N. Am.; *Anciotrocerus conspicuus*, Mex.; *Odynerus Californicus*, Cal.; *O. Cordovæ*, Mex.; *O. scutellaris*, Cal.; *O. bidens*, Fla.; *O. arvensis*, *O. annectens*, N. Am.; *O. formosus*, Mex.; *O. turpis*, *O. molestus*, *O. pratensis*, *O. collega*, N. Am.; *O. cluniculus*, *O. propinquus*, Mex.; *O. Xanthianus*, *O. blandus*, Cal.; *O. Kennicottianus*, N. Am.; *O. Texensis*, Tex.; *O. Nortonianus*, N. Am.; *O. coyotus*, *O. zendalus*, *O. Nahuus*, *O. Olmecus*, Mex.; *O. dilectus*, N. Am.; *Pterochilus Aztecus*, *Pt. Mexicanus*, Mex., and *Alastor Mexicanus* from Mex.

A. E. **Holmgren** (Eugenies Resa, 1868) describes on p. 439 as new, *Polistes Panamensis* from Panama; p. 440, *Polybia Saussurei* from Cal. and Puna.

SPHEGIDÆ.

E. **Taschenberg** (Zeitschrift ges. Naturw., 1869) describes as new *Sphex Mexicana* from Mex. and *Ammophila anomala* from Illinois.

POMPILIDÆ.

E. **Taschenberg** (Zeitschrift ges. naturw., 1869) describes as new *Pompilus brevicornis*, *P. Mexicanus*, and *Salius tomentosus* from Mex.

MUTILLIDÆ.

CHAS. A. BLAKE (Trans. Amer. Ent. Soc., Feb., 1871, p. 217) describes as new *Psammotherma Ajax*, Fla.; *Mutilla Briaxus*, Pa.; *M. Grotei*, Col.; *M. Oajaca*, Mex.; *M. Promethea*, La.; *M. Sayi*, Tex.; *M. Leona*, *M. Cinaloa*, *M. Yucatana*, Mex.; *M. Copano*, *M. scæva*, *M. auripilis*, *M. Gorgon*, *M. Helaya*, *M. Comanche*, Tex.; *M. coccineo-hirta*, Cal.; *M. Sumichrasti*, Mex.; *M. Hector*, *M. Castor*, Kansas; *M. Bexar*, *M. Waco*, Tex.; *M. apicalata*, Mex.; *M. canella*, *M. macilenta*, Tex.; *M. obscura*, Mass.; *M. Azteca*, Mex.; *M. melanosoma*, Pan.; *M. trisignata*, Fla.; *M. Cressoni*, *M. Nortoni*, *M. Toluca*, *M. Ariadne*, *M. formosa*, *M. balopilus*, *M. Altimiæ*, *M. Xalisco*, Mex.; *M. Floridana*, Fla.; *M. Tolteca*, Mex.; *M. Cypris*, Ga.; *M. mutata*, *M. scævola*, *M. balteola*, Atlantic States; *M. Oceola*, Fla.; *M. Sanborni*, Mass.; *M. flavida*, Tex.; *M. laticeps*, *M. Xalapa*, *M. Hapoteca*, Mex.; *M. Gila*, Tex.; *M. Robinsoni*, *M. Lerma*, *M. bisignata*, *M. gothica*, *M. Izucar*, *M. Chiapa*, *M. petricola*, *M. auripes*, *M. minutissima*, *M. psammadroma*, Mex.; *M. Canadensis*, Can.; *M. Brazoria*, Tex.; *Agama mendica*, Nev.; *A. imperialis*, Tex.; *A. Nokomia*, Ariz.; *A. Danaus*, *A. melicausa*, *A. Tapajos*, Tex.; A. *triangularis*, Nev.; *A. pallida*, *A. hyalina*, *A. Belfragei*, Tex.; *A. Alcanor*, Ariz.

FORMICIDÆ.

GUSTAV MAYR (Verh. Zool. bot. Ges., Vienna, Dec. 7, 1870) describes as new *Camponotus vicinus*, U. S.; *Prenolepis parvula*, N. Y.; *Polyergus lucidus*, Conn.; (with *Formica Schaufussi* as slaves in their nest); *Hypoclinea plagiata*, Ill.; *Liometopum apiculatum*, *Platythyrea inconspicua*, *P. pruinosa*, *Guamptogenys concentrica*, *G. regularis*, *Lobopelta Mexicana*, *Cheliomyrmex Nortoni*, Mex.; *Eciton Californicum*, Cal.; *Pheidole inermis*, *P. Bilimeki*, *P. ursus*, Mex.; *P. Californica*, Cal.; *P. striaticeps*, *P. picea*, Mex.; *P. bicarinata*, Ill.; *Cremastogaster opaca*, *C. Sumichrasti*, *C. formosa*, *C. corvina*, *C. atra*, Mex.; *C. læviuscula*, *C. clara*, Fort Cobb, Tex.: *C. minutissima*, Tex.; and others from South America.

ICHNEUMONIDÆ.

C. V. RILEY (Rep. Nox. Ins. Mo., 24) describes the habits of *Sigalphus curculionis* Fitch, with figures of the different stages, and describes as new *Porizon conotracheli*, both parasites of *Conotrachelus nenuphar* Herbst; on p. 158 *Microgaster limenitidos* n. sp., a parasite of *L. Disippus* God.

S. H. SCUDDER (Amer. Nat., v. 788) notices the occurrence of hymenopterous larvæ in an adult beetle (Pimelia) in Egypt.

A. E. HOLMGREN (Eugenies Resa, 1868) describes as new *Ichneumon astutus;* on p. 401 *Hemiteles gastricus;* p. 418 *Sagarites Califor-*

nica; p. 405 *Pimpla transgressa, Bassus maculifrons, Limneria hospita,* and *Saprotichus* (n. gen.) *vitticollis* from Cal.

PROCTOTRYPIDÆ.

A. E. HOLMGREN (Eugenies Resa, 1868) describes on p. 434 as new *Proctotrupes Californica* from Cal.

CHALCIDIDÆ.

F. WALKER (Trans. Ent. Soc., London, 1869, p. 313) describes *Megastigmus albifrons* n. sp., from California.

F. WALKER (Notes, etc., 47) describes *Chalcis pubescens* n. sp., and *Smicra pompiloides* n. sp. from Mexico.

W. LEBARON (Rep. Nox. Ins., Ill., 32) describes *Aphelinus mytilaspis* n. sp., destructive to *Mytilaspis conchiformis.*

C. V. RILEY (Rep. Nox. Ins. Mo., 157) provisionally describes as new *Trichogramma? minuta,* an egg-parasite of *Limenitis Disippus* God. (It differs from Trichogramma in having only 5-jointed antennæ, and Mr. Riley has since given it the MS. name of *Pentarthron minutum.*)

P. S. SPRAGUE (Can. Ent., iii, 235) notes the discovery of the parasitism of *Pteromalus puparum* (Linn.) on *Pieris rapæ.*

J. A. LINTNER (Amer. Nat., v. 725) notices the parasitism of *Pteromalus puparum* Linn. on *Pieris rapæ* Schrank, in New York.

A. E. HOLMGREN (Eugenies Resa, 1869) describes as new *Brachymeria Panamensis,* from Panama.

TENTHREDINIDÆ.

G. J. BOWLES (Can. Ent., iii, 7) notes the habits of *Nematus ventricosus* Klug.

W. SAUNDERS (Can. Ent., iii, 25) notices the habits of the same.

W. LEBARON (Rep. Nox. Ins. Ill., 79) gives an account of the habits of *Selandria rosæ* Harris.

A. S. PACKARD, JR. (Rep. Inj. Ins. Mass., p. 6) notices the habits of *Nematus ventricosus* Klug, and *Pristiphora grossulariæ* Walsh.

LEPIDOPTERA RHOPALOCERA.

C. J. S. BETHUNE (Can. Ent., iii, p. 81) gives a list of seventeen butterflies taken on the borders of Lakes Huron and Superior.

W. H. **Edwards** (Butterflies of N. A., parts 8 and 9). The following species have been figured and described in this magnificent work, during the year 1871:—*Neophasia menapia* (= *Pieris tau*), *Pieris Beckerii*, n. sp., *P. vernalis*, *P. Virginiensis*, *Argynnis Nevadensis*, *Grapta comma*, *G. dryas*, *G. interrogationis* vars. *umbrosa* and *Fabricii*, *Papilio Ajax* vars. *Walshii*, *Telamonides* and *Marcellus*.

W. H. **Edwards** (Trans. Amer. Ent. Soc., Vol. iii, pp. 189–196), describes fourteen new species.

W. H. **Edwards** (Can. Ent., iii, p. 70, 162). Rearing butterflies from the egg. This article contains an account of experiments in raising the varieties of *Papilio Ajax* and *Grapta interrogationis*.

W. F. **Kirby**. A Synonymic Catalogue of Diurnal Lepidoptera. London. Van Voorst. This work is indispensable to Lepidopterists, being a complete catalogue of described butterflies of the whole world.

A. R. **Grote** (Can. Ent., ii, p. 165). On *Thecla inorata* G. and R., and *T. falacer* Godt. This paper criticizes Mr. Scudder's article "On the Synonymy of *Thecla calanus*" (Proc. Bost. Soc. Nat. Hist.), and gives Mr. Grote's views of the true synonymy of these species.

A. R. **Grote** (Can. Ent., iii, p. 101), gives a list of Lepidoptera taken near Demopolis, Ala., and describes *Thecla Dolichos* Hübn.

J. A. **Lintner** (Trans. Amer. Ent. Soc., iii, p. 197). On *Grapta interrogationis* and *G. Fabricii* of Edwards. In this paper exception is taken to Mr. Edwards' remarks on these forms. Mr. Lintner gives anew his reasons for applying the name *interrogationis* to the red winged, and *umbrosa* to the dark winged forms.

H. W. **Parker** (Can. Ent., iii, p. 51), describes the male of *Hesperia conspicua* Edw. taken in Iowa, July 4.

H. W. **Parker** (Can. Ent., iii, p. 112). The Nisoniades Butterflies. This paper contains brief descriptions of the markings of several species of this genus. Mr. Parker doubts the distinctness of *N. Horatius* and *Virgilius*, and also of *Ennius* and *Juvenalis*.

E. B. **Reed** (Can. Ent., iii, p. 95), continues his accentuated list of Canadian Lepidoptera.

C. V. **Riley** (Can. Ent., iii, p. 52). How to distinguish between *Limenitis Disippus* Godt. and *L. ursula* Fabr., in their preparatory states.

C. V. **Riley** (Third Report on the Insects of Illinois, pp. 142-175). The Natural History of *Danais Archippus* and *Limenitis Disippus*. This is a good account of the life history of these butterflies, containing also descriptions of their parasites and remarks on "Mimicry."

S. H. **Scudder** (Entomologist's Monthly Mag. Nov. No. 90). On the Embryonic Larvæ of Butterflies. (Reprinted in the Can. Ent., iv, p. 45.) This article contains descriptions of the youngest stages of the larvæ of Satyrus, Hipparchia, Limenitis, Grapta, Argynnis, Melitæa, Lycæna, Colias, Pieris, Papilio and Hesperia.

H. B. **Moeschler** (Entomologische Zeitung, Stettin, 1870, p. 113, 251). Beiträge zur Schmetterlingsfauna von Labrador. The author gives synonymical and critical remarks on the butterflies of Labrador, with a list of additions to the fauna by Scudder and Packard.

J. A. **Boisduval** (Annales de la Soc. Entomologique de Belgique. T. xii, 5, 1869) describes the Lepidoptera collected in California by Lorquin.

J. A. **Boisduval** (Considerations sur les Lépidoptères envoyés du Guatemala à M. de l' Orza. 8vo. Rennes. 1870. pp. 100. Many of his new species are synomymes (see Zool. Record. 1870).

A. G. **Butler** (Cistula Entomologica, 1. 1869, 13). Contains descriptions of new Butterflies from Cuba.

A. G. **Butler** (Ent. Month. Mag., vi, 250, 1870). On new or recently described species of Diurnal Lepidoptera. Several Butterflies from Central America and Mexico are described and figured.

A. G. **Butler** (Proc. Zool. Soc. London. 525). A Revision of the species formerly included in the Genus Terias (Pierinæ). Treats of the synonymy of the American species.

A. G. **Butler** (Annals and Mag. Nat. Hist., 282). Descriptions of some new species of Lepidoptera, chiefly from the collection of Mr. W. Saunders. Contains the description of a new butterfly from Honduras.

A. G. **Butler** (Lepidoptera Exotica, or Descriptions and Illustrations of Exotic Lepidoptera. Pts. 1, 2, 1869, 3–6, 1870). Contains descriptions of several Central American species.

A. G. **Butler** (Trans. Ent. Soc., 1870, 9). Descriptions of six new species of Callidryas. Four of the species are from the West Indies, Central America and Mexico.

R. **Felder** (Verhandlungen d. K. K. Zool.-Bot. Gesellschaft, xix, 469, 1869). Contains descriptions of Central American butterflies.

W. C. **Hewitson** (Ent. Month. Mag., vi, 68, 1860) describes a new butterfly from Nicaragua.

W. C. **Hewitson** (Trans. Ent. Soc., London, 33, 1869) describes a new butterfly from Nicaragua.

NYMPHALIDÆ.

W. H. **Edwards** (Butt. N. Amer., Pts. 8 and 9) describes and figures *Argynnis Nevadensis* Edws.; *Grapta comma* Harr., *G. dryas* Edws., *G. interrogationis* Fabr., vars. *umbrosa* Lint., and *Fabricii* Edws.; giving his experiments to prove the varietal nature of these two latter forms.

W. H. **Edwards** (Can. Ent. iii, p. 71) states that he has raised both *Grapta interrogationis* (Edws.) and *G. Fabricii* (Edws.) from eggs laid by the former.

W. H. **Edwards** (Can. Ent. ii, p. 162) describes the larva and pupa of *Melitæa Harrisii*, which were found by Mr. T. L. Mead, feeding on *Actinomeris helianthoides* Nutt.; and also the same stages of *Euptoieta Claudia*.

W. H. **Edwards** (Trans. Amer. Ent. Soc., iii, pp. 189-193) describes the following new species, *Argynnis Bischoffii*, from Aliaska; *Melitæa Sterope*, from Oregon; *M. Thekla*, Cal.; *Eresia punctata*, Arizona; *Chionobas Stretchii*, Nevada; *Satyrus Gabbii*, Oregon.

C. V. **Riley** (Can. Ent., p. 52) describes the differences in the larval and pupal stages of *Limenitis Disippus* and *L. Ursula*, which are limited to the anterior horns of the larva, and the dorsal hump of the pupa.

C. V. **Riley** (Third Rep. on Insects of Ill.) gives the Natural History of *Danais Archippus* and *Limenitis Disippus*.

W. **Saunders** (Can. Ent., iii, p. 156) records *Danais Archippus* swarming on the borders of Lake Erie.

P. S. **Sprague** (Can. Ent., iii, p. 157) records this butterfly swarming also in New England.

S. H. **Scudder** (Ent. Monthly Mag. No. 90, p. 122) describes early larval stages in the genera Satyrus, Hipparchia, Limenitis, Grapta, Argynnis and Melitæa.

H. B. **Möschler** (Ent. Zeit. Stettin, 116) gives descriptions and remarks on the Labrador species of Chionobas.

A. G. **Butler** (Ent. Month. Mag., vi, 1870, 250) describes as new, with figures, *Euptychia Gulnare*, from Panama.

J. A. **Boisduval** (Ann. Soc. Ent., Belgique, 5, 1869) describes as new *Melitæa Callina, M. Epula, M. Orsa, M. Helcita, M. Pola, M. Sonoræ, M. Leanira, Argynnis Epithore, A. Mormonia, A. Egleis, A. Juba, A Hydaspe, A. Adiante, Chionobas Californica* and *Satyrus œtus* from Cal.

A. G. **Butler** (Cist. Ent., 4, 1869) describes as new *Morpho Luna* from Mex. In Cist. Ent., ii, 1870, 26, he describes as new *Lymanopoda Issacha* and *Pedaliodes Oaxes* from Cuba.

A. G. **Butler** (Lep. Exot., iii, 1870, 17) describes and figures as new *Taygetis jimna* from Panama.

W. C. **Hewitson** (Trans. Ent. Soc., London. 1869, 34) describes as new *Eresia Alsina, Eubagis Sosthenes* and *Hætera polita* from Nicaragua.

W. C. **Hewitson** (Ent. Month. Mag., vi, 1870, 177) describes as new *Opsiphanes orgetorix* from Chontales.

J. A. **Boisduval** (Lep. Guat., 1870, 56–58) describes as new *Pavonia Dardanus* from Honduras, Guatemala, and Columbia, *P. Scamander* from Guatemala, Nicaragua and Venezuela, and *Eriphanis Wardii* from Guatemala and Nicaragua, *Hætera Heracles* Boisd. (= Pap. Luna var? probably = H. pallida or H. rubecula Salv. and Godm.) Zool. Record from Honduras, *Neonympha metaleuca* and *Taygetis Cecilia* from Guatemala.

R. **Felder** (Verh. K. K. Zool. bot. Ges., xix, 1869, 465) describes as new from Mexico, *Eresia pallescens*, Puebla, *E. graphica*, Huahuapan, *E. socia, E. Archesilea*, Cordoba, *E. obscurata*, Rio-Atajac, *Synchloe misera* Boisd. in litt., Huahuapan, *Myscelia Rogenhoferi*, Huahuapan, *Epicalia Esite* Boisd. in litt., Potrero, *Pyrrhogyra Neis*, Atajac, *Heterochroa Emathia, Nymphalis Hedemanni, N. Pithyusa*, Potrero, *N. Callidryas*, Cordoba, *Cyllopsis* (n. gen. allied to Taygetes) *Hedemanni*, Potrero, *Pindis* (n. gen. allied to Taygetes) *squamistriga*, Huahuapan, Cuernavaca.

HELICONIDÆ.

W. C. **Hewitson** (Trans. Ent. Soc., London, 33, 1869) describes as new *Heliconia Diotrephes* from Nicaragua.

J. A. **Boisduval** (Lép. Guat., 1870, 29) describes as new *Heliconia Rosina* from Costa Rica and Mex., *H. Euryus* from Guat., *H. Thetis* from Nic., *Ithomia fizella* and *I. depauperata* from Guat.

LYCÆNIDÆ.

G. J. **Bowles** (Can. Ent., p. 179) reports the capture of *Polyommatus Porsenna* for the first time in the neighborhood of Quebec.

W. H. **Edwards** (Trans. Amer. Ent. Soc., iii, pp. 193-194) describes as new, *Thecla Dryope*, Cal.; *Lycæna Mintha*, Nevada, and *L. Fulla*, Cal.

A. R. **Grote** (Can. Ent. iii, p. 101) describes *Thecla Dolichos* Hübn.

A. R. **Grote** (Can. Ent. ii, p. 165) gives the synonymy of *Thecla inorata* G. and R. and *T. Falacer* Godt.

S. H. **Scudder** (Ent. Monthly Mag. No. 90, p. 122) describes early larval states in Lycæna.

H. B. **Möschler** (Ent. Zeit. Stettin, 144) gives a description of *Polyommatus Epixanthe* Bd. and Lec., from Labrador.

J. A. **Boisduval** (Ann. Soc. Ent. Belgique, 1869, 43) describes as new *Thecla Borus*, *T. Nelsoni*, *Polyommatus nivalis*, *P. Zeræ*, *Lycæna regia*, *L. lupini*, *L. nivium*, *L. Philemon*, *L. rufescens*, *L. erymus*, *L. Polyphemus*, *L. Erius*, *L. Nestor*, *L. Phileros*, *L. Rhœa*, and *L. Suasa*, from Cal.

J. A. **Boisduval** (Lép. Guat., 1870, 13) describes as new *Eumenia Godartii* "(= Toxæa Godt." Zool. Rec.) from Guatemala, and *E. Toxana*, *Thecla gauna* from Costa Rica, *Lycæna cassioides* "(= *Pol. Pirithous* Godt. *nec* Linn." Zool. Rec.) from Honduras and Mexico, *L. cassidula* from Honduras, *L. nyagora* and *L. gozora* from Honduras and Mexico.

PAPILIONIDÆ.

C. J. **Bowles** (Can. Ent., iii, p. 179), records the capture of *P. Asterias* for the first time at Quebec.

W. H. **Edwards** (Butt. N. Amer., Pt. 8) figures and describes *Neophasia menapia* Felder (= *Pieris tau* Scudd.); *Pieris Beckerii* n. sp., *P. vernalis* Edws. and *P. Virginiensis* Edws.; also, in Part 9, three varieties of *Papilio Ajax* Linn. viz.: — *Walshii* Edws., *Telamonides* Feld. and *Marcellus* Boisd., giving also his experiments in breeding to prove that these forms are only varietal.

W. H. **Edwards** (Can. Ent. ii, p. 162, and iii, p. 70). Experiments in raising *Pap. Ajax* and its varieties. From one batch of one hundred and twenty-five eggs he has raised fifty-eight *Marcellus*, one *Walshii* and one *Telamonides*.

W. H. **Edwards** (Trans. Amer. Ent. Soc., iii, p. 189) describes *Pieris Calyce* n. sp., from Nevada.

W. H. **Edwards** (Can. Ent., ii, p. 179) surmises, from the results of breeding, that at least two species pass under the name of *Colias Philodice.*

J. M. **Jones** (Can. Ent., iii, p. 37) records *Pieris rapæ* abundant about Halifax, N. S., in June, 1871.

H. W. **Parker** (Amer. Nat. iv, p. 761) records the capture of *Callidryas Eubule* at New Bedford in the summer of 1870.

S. I. **Smith** (*ibid.*) reports the same butterfly at Fire Island, near Long Island, N. Y.

S. H. **Scudder** (Ent. Monthly Mag., No. 90, p. 122) describes the young stages of the larvæ in the genera Papilio, Pieris and Colias.

J. A. **Boisduval** (Ann. Ent. Soc., Belgique, 5, 1869) describes as new *Pieris Ninonia, P. nasturtii, P. resedæ, P. iberidis, Anthocaris Angelina, A. ausonides* [? = ausonia, see Brauer's Berichte] from Cal.

J. A. **Boisduval** (Lep. Guat., 1870, 7) describes as new *Papilio Lycimenes* " (= *Iphidamus* Gray *nec* Fabr.) from Costa Rica" Zool. Rec.

A. G. **Butler** (Trans. Ent. Soc., 1870, 9) describes as new *Callidryas virgo* from Mex. and N. Grenada, *C. Hartonia* from Jamaica, *C. Editha* from Haiti, *C. Jada* from Guatemala.

A. G. **Butler** (Cist. Ent., 1869, 13) describes as new *Callidryas minuscula* from Havana.

A. G. **Butler** (Ann. Mag. Nat. Hist., iv, 1869, 202) describes as new *Callidryas rorata* from St. Domingo.

R. **Felder** (Verh. d. K. K. Zool.-bot. Ges., xix, 465, 1869) describes as new *Terias ingrata* from Potrero, *T. Sidonia* from Campeche, *T. Nelphe, T. celata,* and *T. Leucilla* from Potrero.

W. C. **Hewitson** (Ent. Month. Mag., vi, 68, 1869) describes as new *Leptalis Deione* from Nicaragua.

HESPERIIDÆ.

W. H. **Edwards** (Trans. Amer. Ent. Soc., iii, p. 195–9) describes the following new species: *Syrichtus Petricus,* from Nevada; *Cyclopides Skada,* Kodiak; *Hesperia minima,* Texas.

H. W. **Parker** (Can. Ent., iii, p. 51) describes the male of *Hesperia conspicua* Edws., from a specimen taken in *Iowa,* July 4.

H. W. **Parker** (Can. Ent., p. 112) doubts the distinctness of *Nisoniades Horatius* and *Virgilius,* and also of *Ennius* and *Juvenalis,* separated by Scudder and Burgess. In the same article brief descriptions of *N. Juvenalis, N. Martialis, N. Brizo, N. Horatius, N. Persius, N. Lucilius* and *N. Icelus* are given.

S. H. **Scudder** (*loc. cit.*) describes the early larval characteristics of *Hesperia.*

A. G. **Butler** (Trans. Ent. Soc. 1870, 492) describes as new, *Goniuris Corydon* from Cuba, *Eudamus epigena* from Mexico, *Æthilla jariba* from Cuba, and *Æ. jaira* from West Indies, *Phlebodes unia* from St. Domingo.

R. **Felder** (Verh. K. K. Zool.-bot. Gesell. xix, 1869, 465) describes as new from Mexico *Ancyloxypha simplex*, Cordoba, Potrero, *Leucochitonea lugubris* Orizaba, *L. pastor*, Lerma, *L. canescens*, Potrero, *L. pulcherius*, *L. hyalophora*, *L. pulverulenta*, Orizaba, *L. emorsa* and *L. funebris*, Cuernavaca, *Helias pallida*, Jalapa.

ERYCINIDÆ.

W. H. **Edwards** (Trans. Amer. Ent. Soc., iii, pp. 195–196) describes as new, *Lemonias Palmerii*, Utah.

S. H. **Scudder** (Ent. Monthly Mag., No. 60, p. 122) describes the early larval characteristics of *Lycæna*.

A. G. **Butler** (Ann. and Mag. Nat. Hist., 283) describes for the first time *Emesis clearista* Doubld., MS., from Honduras.

A. G. **Butler** (Ent. Month. Mag., vi, 1870, 252) describes as new *Nymphidium lilina* from Mexico.

A. G. **Butler** (Ann. Mag. Nat. Hist. 1870, v, 364) describes as new *Emesis zela* from Venezuela and Mex., *Chanis Libua* from Mexico?

A. G. **Butler** (Cist. Ent., ii, 1870, 31, Lep. Exot. Pl. 14, fig. 5) describes and figures *Aricoris Jansone* from Chontales.

W. C. **Hewitson** (Trans. Ent. Soc. London, 1869, 35) describes as new, *Mesosemia asa* and *Nymphidium Onæum* from Nicaragua.

W. C. **Hewitson** (Ent. Month. Mag., vii, 1870, 8; and with figure in Exot. Butt. 75) describes as new, *Necyria beltiana* from Nicaragua, *Lymnas? Bryaxis*, *Emesis lacrines*, *Symmachia leena*, *S. Threissa*, *S. cleonyma*, *Mesene Xypete*, *Lemonias Lasthenes*, *Aricoris Cleomedes* from Chontales.

J. A. **Boisduval** (Ann. Ent. Belgique, 1869) proposes *Chrysobia*, as a new genus for *Lemonias mormonia* Felder.

J. A. **Boisduval** (Lép. Guat. 1870, 19, 20) describes as new, *Erycina Zinna* from Nicaragua and Columbia, *E. Erigone* from Honduras and Mexico, *Nelone aurimma* from Guat., *Mesene Hewitsonii*, *M. simbla*, *M. niciades* and *M. macularia* from Guat. and Honduras, *Hypophylla umbra* from Honduras, and *Desmozona ascolides* from Guatemala.

LEPIDOPTERA HETEROCERA.

C. V. **Riley**. Third Annual Report on the Noxious, Beneficial and other Insects of Missouri.

W. **LeBaron**. First Annual Report on the Noxious Insects of Illinois.

A. S. **Packard, Jr.** (Proceedings Boston Soc. Nat. Hist., xiii, 381). Catalogue of the Phalænidæ of California.

A. S. **Packard, Jr.** First Annual Report on the Injurious and Beneficial Insects of Massachusetts.

A. S. **Packard, Jr.** (Second and Third Ann. Rep. Peab. Acad. Science, p. 85). List of Insects collected at Pebas, Ecuador, and presented by Prof. James Orton.

E. B. **Reed** (Canadian Entomologist, iii, 5). The Plum Sphinx Moth.

G. J. Bowles (Can. Ent., iii, 7). Quebec Currant Worms; p. 144, List of Lepidoptera taken at Quebec; p. 201, Notes on Samia Columbia.

W. **Saunders** (Can. Ent., iii, 12, 25, 66, 149). Hints to Fruit Growers; p. 14, Entomological Gleanings; p. 22, On the Larva of the Peach Borer; pp. 35, 225, Notes on Lepidoperous Larvæ; pp. 76, 130, 186, 193.

V. T. **Chambers** (Can. Ent., iii, 23). A new species of *Cemiostoma;* pp. 54, 84, 108, 127, 146, 161, 182, 205, 221, Microlepidoptera.

W. **Couper** (Can. Ent., iii, 32, 61, 178). Entomology, i–iii.

C. J. S. **Bethune** (Can. Ent., iii, 81). Entomological Notes during a Trip to Lakes Huron and Superior.

A. R. **Grote** (Can. Ent., iii, 101, 124, 181, 192). Descriptions of Lepidoptera from Alabama; pp. 192. Description of a species of *Agrotis* from Canada.

Chas. R. Dodge (Can. Ent., iii, 167). Description of a new *Arctia* from Colorado.

F. G. **Sanborn** (Proc. Bost. Soc. Nat. Hist., xiii, 205). Habits of *Callosamia Promethea.*

H. B. **Moeschler** (Ent. Zeit. Stettin, 251, 265, 364) in Beiträge zur Schmetterlingsfauna von Labrador, gives a list of Labrador moths, with descriptive and synonymical remarks.

A. G. Butler (Proc. Zool. Soc., London, 79). Descriptions of some new species of exotic Lepidoptera. Contains a note relative to *Coloradia Pandora* Blake.

A. G. Butler (Lep. Exot., 1870) describes several new Central American forms.

J. A. Boisduval (Ann. Soc. Ent., Belgique, 1869) describes new Californian Sphingidæ and Bombycidæ.

L. W. Schaufuss (*Nunquam Otiosus.* Die Exotischen Lepidoptera Heterocera der früher Kaden'schen Sammlung, 1870, 7–23). Contains a few Central American Sphingidæ and Zygænidæ.

A. Speyer (Ent. Zeitung Stettin, 1870, 400). Europaisch-amerikanischer Verwandtschaften. He thinks that the Lepidoptera of Europe and America have had a common descent, and indicates in ancient times a continental connection across the Atlantic ocean.

G. A. W. Herrich-Schæffer. Die Schmetterlinge der Insel Cuba. Regensburg, 1870. Contains descriptions of new Phalænidæ.

SPHINGIDÆ.

C. V. Riley (Rep. Nox. Ins. Missouri, 140), figures *Deilephila lineata* and two varieties of its larva.

A. S. Packard, Jr. (Rep. Peab. Acad., 85) records *Philampelus Anchemolus* (Cram.), *Amphonyx Duponchel* Poey, from Pebas, Peru.

E. B. Reed (Can. Ent. iii, 5) gives the history, with figures, of *Sphinx drupiferarum*, Sm.-Abb.

A. Speyer (Ent. Zeit., Stettin, 1869, 83) regards the American *Sphinx lineata* as different from the European one of the same name, which he calls *S. livornica* E.

J. A. Boisduval (Ann. Ent. Soc. Belgique, 1869 , 66) describes as new *Macroglossa Thetis*, *M. Erato* *Sphinx seqoiæ*, *S. strobi*, *Smerinthus ophthalmicus* from Cal.

J. A. Boisduval (Lép. Guat. 1870, 66) describes as new *Macroglossa corvus* from Nicaragua, *Perigonia caliginosa* (Feld. ined.) *P. ilus* from Honduras and Mex., *Aleuron chloroptera* ("probably = Sphinx chloroptera Perty" Zool. Rec.) from Guatemala, Honduras and Para, *Ambulyx rostralis* (Feld. ined.) from Nicaragua and New Grenada, *Chærocampa aristor* from Guat., *C. fugax* from Hond. and Mex., *Sphinx sesqui-*

plex (Feld. ined.) from Guat., *S. merops* from Hon. and Mex., *S. andromedæ* from Hond. and Oajaca, *Ancæryx Rhæbus* from Hond. and Mex., *A. omphalæ* from Brazil and Nicaragua.

L. W. SCHAUFUSS (Nunq. Ot. Lep. Exot., 1870) describes as new *Macroglossa Cunninghami* from Nicaragua, *Chærocampa curvatus* from Cuba.

ÆGERIADÆ.

C. V. RILEY (Rep. Nox. Ins. Missouri, 75) describes and figures *Ægeria polistiformis* Harr.

G. J. BOWLES (Can. Ent., iii, 7) notices briefly the habits of *Ægeria tipuliformis* (Linn.)

W. SAUNDERS (Can. Ent., iii, 22) publishes a description of the habits of *Ægeria exitiosa* Say, with a figure.

J. A. BOISDUVAL (Ann. Soc. Ent., Belgique, 1869, 63) describes as new *Sesia nomadæpennis*, *S. chrysidipennis*, and *S. bibionipennis* from Cal.

ZYGÆNIDÆ.

C. V. RILEY (Rep. Nox. Ins Missouri, 63) figures and describes *Psychomorpha epimenis* (Drury) and its larva, and shows wherein its larva differs from those of *Alypia octomaculata*, *Eudryas grata* and *E. unio*, all of them closely resembling each other and feeding on grape-vine.

A. G. BUTLER (Lep. Exot. vi, 1870) describes and figures as new *Castnia diva* from Chontales.

J. A. BOISDUVAL (Lép. Guat. 1870, 81) describes as new *Mastigocera Œdippus* and *M. clavipes* from Guat. and Mex.

BOMBYCIDÆ.

C. V. RILEY (Rep. Nox. Ins, Missouri, 68) notices and figures *Spilosoma Virginica* (Fabr.) in its different stages; p. 117, *Clisiocampa Americana* Harr. and *C. sylvatica* Harr.; p. 130, *Hyphantria textor* Harr.; p. 132, *Callimorpha fulvicosta* Clem.

W. LEBARON (Rep. Nox. Ins. Illinois, 13) notices the habits of *Orgyia leucostigma* (Sm.-Abb.), *Hyphantria textor* Harr ; p. 47, *Callimorpha fulvicosta* Clem.

A. S. PACKARD, JR. (Rep. Peab. Acad., 85) describes as new *Attacus Amazonia*, and records *Zeuzera* (Endoxyla) *xylotribus* H. Sch. from Pebas, Peru.

W. SAUNDERS (Can. Ent., iii, 14) gives a long note on the eggs of *Orgyia leucostigma* (Sm.-Abb.) On p. 36 he describes the larva of *Gnophria vittata* Harr., and *Hyphantria cunea* (Drury).

A. R. GROTE (Can. Ent., iii, 124) describes as new *Pygarctia abdominalis*, and gives a note on *Parorgyia leucophæa* from Alabama.

W. SAUNDERS (Can. Ent., iii, 149) gives an account of the habits of *Platysamia Cecropia* (Linn.) with figures; on p. 186 he describes the larva of *Halesidota maculata* Harr.; and on p. 227 that of *Euphanessa mendica* (Walk.)

J. A. BOISDUVAL (Ann. Soc. Ent., Belgique, 1869, 85) describes as new *Agarista dipsaci*, *A. Lorquinii*, *A. Sacramenti*, *A. Mariposa*, *A. Grotei*, *Ctenucha corvina*, *C. Robinsonii*, *C. Harrissii*, *Callimorpha guttata*, *Nemeophila cæspitis*, *N. cichorii*, *Chelonia autholea*, *C. Achaia*, *C. Doris*, *C. Nerea*, *Arctia sciurus*, *Phægoptera cinnamomea*, *P. quercus*, *P. salicis*, *Lithosia Decia*, *L. adnata*, *L. Lena*, *L. faustinula*, *L. nexa*, *Saturnia ceanothi* (= *Euryalus* Boisd. olim.) *Telea eglanterina*, *Bombyx pseudoneustria*, *Dicranura scolopendrina*, *Clostera incarcerata*, *Gluphisia crenata*, *Hepialus hectoides* and *H. Californicus* from Cal.

CHAS. R. DODGE (Can. Ent., iii, 167) describes as new *Arctia Williamsii* from Colorado Terr., with a figure.

G. J. BOWLES (Can. Ent., iii, 201) notices the occurrence in Canada of *Platysamia Columbia* (Smith), with notes on its habits.

F. G. SANBORN (Proc. Bost. Soc. Nat. Hist., xiii, 205) notices the habits of *Callosamia Promethea* (Drury).

H. B. MÖSCHLER (Ent. Zeit. Stettin, 251) considers Grote's *Hepialus pulcher* as a synonyme of *H. hyperboreus* Möschler, and thinks it possible that *H. Labradoriensis* Pack. is the female of *H. hyperboreus*. On p. 252 he redescribes *Dasychira Rossii* (Curt.) from four fresh male and female specimens. He also regards *Edapteryx bilineata* Pack. as identical with the European *Platypteryx lacertinaria* Linn.

A. G. BUTLER (Proc. Zool. Soc., London, 83) refers Blake's *Coloradia Pandora* to the genus *Dirphia* of F. Walker. Butler's *D. venata* is from Buenos Ayres.

H. LANDOIS (Corr. Blatt. d. Ver. d. Preuss. Rheinlande, 3 Folgi. 6 Yahrg., 1869, 84). On a new (?) American silk worm, *Saturnia Cecropia* and *Cyclops*.

J. A. BOISDUVAL (Lép. Guat., 1870) "describes as new *Ctenucha venosa* Walk." (Zool. Rec.) and describes as new *Melandia* [Melanchroia] *æquinoctialis* from Guat. and Hond., *Epilais* [Dioptis, sect. Hyrmina] *æquatorialis* (Feld. ined.) from Hond., Mex., Guat., *E. zetila* from Guat., *E. melda* from Nicaragua and Quito, *Ditaxis* [Dioptis] *sora* from Guat., *Charidea arrogans* from Guat., Hond., *C. hæmatodes* and *C. eximia* from Hond. and Mex., *Ctenucha salatis*, *C. pollinia* from Hond. and Guat., *C. opaca* from Hond., Guat., Mex., *Letocles* [Siosta] *alcera* from Nicaragua and Amazon, *L. Decia* from Guatemala, *Milodora agis* from Nicaragua, *Thebrone* [Pericopis] *arema* from Nicaragua and Venezuela, *T. rubrimargo* from Hond. and Mex., *Aphisaon* [Pericopis] *salvatoris* from Hond. and Guat., *Evagra* [Dioptis] *notochloris* from Hond., *E. jalifa* from Hond. and Mex., *E. affinis* from Hond. and Guayaquil, *Cocastra gentilis*, *C. melanchroia* (Feld. ined.) from Guat., *Calepidos* [Esthema] *celina* from Guat., *C. anacharis* from Nicaragua, *Che-*

tone [Pericopis] *lorzæ*, *C. phœba*, *C. aorsa* from Guat., *C. iscariotes* from Hond. and Guat., *C. Felderi* from Nic., *C. heliconides* from Guat., *Xanthyris* [Chrysauge] *pseudisis* from Nic. and Venezuela, *X. adunca* from Nic. and Bogota, *X. basina* from Guat. and Venezuela, *X. osera* from Hond. and Mex., *Pyralopsis divisa* from Guat., *Retila* (Josia) *pseudena*, *R. enoides* from Hond. and Mex., *Lithosia cordula* from Hond. Mex., *L. sanguineola* from Guat., Mex., *Doracis coracina*, from Hond., Mex., *Euchelia jeuna* from Guat., Mex., *Dorimena* (Daetis) *magdala*, *Spilosoma dilecta* from Hond., Mex., *Phægoptera albiguttata* from Hond.

A. G. BUTLER (Cat. Lep. Fabr. 291, and Lep. Exot. vi, 1870, 46) describes as new *Pericopis Jansonis* from Chontales.

NOCTUIDÆ.

C. V. RILEY (Rep. Nox. Ins. Missouri, 70) gives the history of *Acronycta oblinita* Sm. and Abb., with figures; also (p. 72) of *Amphipyra pyramidoides* Guen., with two varieties, *fulvosa* and *obscura*; p. 104, *Heliothis armigera* (Hübn.); p. 109, *Prodenia autumnalis* Riley, and describes as new *A. conspersa*. On p. 134 he describes as new *Xylina cinerea*.

W. LEBARON (Rep. Nox. Ins. Illinois, 52) describes the larva of *Acronycta superans* Guen; on p. 56 he notices the habits of *Amphipyra pyramidoides* Guen.

A. S. PACKARD, JR. (Rep. Peab. Acad., 87) records *Crino bellatrix* (Cram.) and *Letis xylia* Guen? from Pebas, Peru.

W. SAUNDERS (Can. Ent., iii, 35) describes the larva of *Noctua clandestina* (Drury); on p. 193 he describes the larva of *Agrotis depressus* Grote, and on p. 226 that of *Acronycta oblinita* (Sm. Abb.)

A. R. GROTE (Can. Ent., iii, 192) describes as new *Agrotis depressus** from Canada, allied to *A. clandestina*.

H. B. MÖSCHLER (Ent. Zeit., Stettin, 254) adds to the list of Labrador Noctuids *Agrotis conflua* Fehr., an European species, *A. Staudingeri* Mösch., *A. lætabilis* Zett., a Finmark species, *A. Islandica* Stdgr., an Iceland species, *A. ypsilon* Hfngl. (= *A. suffusa* S. W.), an European species, and *A. occulta* Linn., var. *implicata* Lefbr., also European, and *Anarta Zetterstedtii* Staud, also found in Norway and Lapland. He regards (p. 265) *Agrotis littoralis* Pack. as = *Pachnobia carnea* Thugbg.; *Agrotis Okakensis* Pack. = *A. Wockei* Mosch.; he describes as new *Mamestra Rogenhoferi*, and considers *Anarta bicycla* Pack.† as = *A. melaleuca* Thngb., and *A. nigrolunata* Pack. = *A. melanopa* Thngb.

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* By a typographical error this species is published as *repressus*, but the larva is described on the next page under the name of *depressus*.

† Packard has previously corrected the synonymy of this and the following species; see Proceedings Amer. Assoc. Adv. Science, vol. xvi, 1868, p. 156.

P. C. Zeller (Ent. Zeit., Stettin, 177) thinks that *Agrotis telifera* Harris is identical with the European *A. ypsilon* (suffusa).

J. A. Boisduval (Ann. Soc. Ent., Belgique, 1869, 88) describes as new *Brephos Californicus* and *B. melanis* from Cal.

A. Speyer (Ent. Zeit., Stettin, 1870, 400) describes as new *Cucullia intermedia* from New York.

PHALÆNIDÆ.

A. S. Packard, Jr. (Proc. Bost. Soc. Nat. Hist., xiii, 381) describes as new from California, *Chærodes nubilata, Heterolocha Edwardsata, Ellopia Californiaria, Tetracis trianguliferata, Azelina Behrensaria, Metanema cervinaria, Boarmia Californiaria, Tephrosia Californiaria, Tephrosia ferruginosaria, Acidalia 5-linearia, Acidalia granitaria, Acidalia Californiaria, A. Pacificaria, A. rubromarginaria, Macaria Californiaria, Halia cineraria, Tephrina marmorata* (from Nevada), *Panagra flavo-fasciata, Selidosema Californiaria, Eupithecia rotundopuncta, E. Nevadata* (from Nevada) *Hypsipetes Californiata, H. 5-fasciata, H. nubilofasciata, Coremia Californiata, Scotosia Californiata, Cidaria nubilata, C. subochreata, C. leoninata, C. rubro-suffusata* (from Nevada), *C. 4-punctata, C. multilineata, Chesias occidentaliata, Baptria Californiata*, and records besides the species enumerated by Guenée, *Azelina Hübneraria* Guen. and *Coremia propugnata* W. V.

A. S. Packard, Jr., (Rep. Inj. Ins. Mass., 13) gives a popular account of *Abraxas ribearia* Fitch, and describes as new *Drepanodes juniperaria* (this is only a variety of *D. varius* G. and R.), with figures illustrating its transformations.

G. J. Bowles (Can. Ent., iii, 8) notices the habits of *Abraxas ribearia* Fitch, and gives a history of the transformations of *Angerona crocaotaria* Fabr., and *Amphidasys cognataria* Gn., all of which feed on the currant.

A. R. Grote (Can. Ent., iii, 103) describes as new *Acidalia persimilata* and *A. purpurissata* from Alabama.

W. Saunders (Can. Ent., iii, 130) describes the larva of *Priocycla armataria* H. Sch., and on p. 209, that of *Hyperetis alienaria* H. Sch.; on p. 225, that of *Stegania pustularia* Gn., and notices the habits of *Metrocampa perlata* Gn.

H. B. Möschler (Ent. Zeit. Stettin, 366) regards *Acidalia Okakaria* Pack. as = *A. frigidaria* Mösch.; *Cidaria nubilata* Pack. = *Lygris lugubrata* Mösch.; *Coremia Labradoriensis* Pack. = *C. munitata* Hübn.

J. A. Boisduval (Lép. Guat.) "redescribes *Urania fulgens* Walk. as new" (Zool. Rec.). He describes as new *Coronis ocylus* from Guatemala and Mex.

G. A. W. Herrich-Schæffer (Schm. Cuba, 1870, 185) describes as new *Chærodes exiliata, Drepanodes griseocostaria, Apicia rectisignaria,* *A. heterochloriaria*, *Pero curvistrigaria*, *Azelina decisaria*, *Boarmia abjectaria*, *B. quadricostaria*, *Geometra croceofimbriata*, *G. desolataria*, *G. centrifugaria*, *G. protractaria*, *Eucrostis albicostaria*, *E. niveociliaria*, *Zonosoma* (= Ephyra Dup. = Anisodis Guén.) *nanularia*, *Z. occipitaria*, *Z. extranearia*, *Asellodes nigropasciaria*, *Acidalia chionæata*, *A. canularia*, *A. subroseata*, *A. flocculuria*, *Neclusia fimbriata*, *Terpnomicta subpusaria*, *Macaria centrosignata*, *M. cellulata*, *M. trientata*, *Larentia subcertaria*, *L. decertaria*, *L. subgaleata*, *L. anguinata*, *L. aristata*, *L. artificata*, *L. baliata*, *L. balteolata* from Cuba.

PYRALIDÆ.

C. V. Riley (Rep. Nox. Ins. Missouri, 61) describes the habits and early stages of *Desmia maculalis* Westw., with figures.

A. R. Grote (Can. Ent., iii, 103) describes as new *Botys plumbicostalis* and *B. anticostalis* from Alabama, and gives a list of other Pyralids from the same locality (Demopolis); on p. 125 gives notes on other species, and describes *Desmia subdivisalis*, n. sp.; on p. 181, *Cataclysta Robinsonii* from Alabama.

H. B. Möschler (Ent. Zeit. Stettin, 371) regards *Scopula glacialis* Pack. as = *S. inquinalis* Zell., and *Eudorea ? frigidella* Pack. as = *E. centuriella* S. V.

P. C. Zeller (Ent. Zeit. Stettin, 177) regards *Pempelia grossulariæ* Pack. as =*Myelois convolutella* Hübn., an European species.

TORTRICIDÆ.

C. V. Riley (Rep. Nox. Ins. Missouri, 101) adds to our knowledge of the habits of *Carpocapsa pomonella* Linn.

W. LeBaron (Rep. Ins. Ill., 20) describes as new *Tortrix malivorana*, and gives an account of its habits.

W. Saunders (Can. Ent., iii, 13) notices and figures *Grapholitha oculana* Harr.; on p. 26 *Carpocapsa pomonella* (Linn.)

H. B. Möschler (Ent Zeit. Stettin, 373) considers *Sciaphila niveosana* Pack. as a synonyme of *S. osseana* Scop., and *Conchylis chalcana* Pack. as = *C. Deutschiana* Zett. He records *Penthina turfosana* H.-Sch. as a Labrador species.

P. C. Zeller (Ent. Zeit., Stettin, 117) regards *Penthina vitivorana* Pack. = *Eudemis botrana* S. V., and *Anchylopera fragariæ* Walsh = *A. comptana* Froel. of Europe.

TINEIDÆ.

A. S. Packard, Jr. (Rep. Inj. Ins. Mass., 24) describes as new *Bucculatrix thuiella*, with figures.

V. T. Chambers (Can. Ent., iii, 23) describes as new *Cemiostoma* *albella*, with an account of its habits. On p. 54 he describes the habits of the species of Lithocolletis, and describes as new *L. tiliaciella*, *L. Clemensella*, and *L. caryæ-albella;* on p. 84 *L. virginiella;* on p. 108, *L. nonfasciella*, *L. Bethunella*, *L. tri-tæniella*, *L. corylisella;* on p. 127, *L. ambrosiella*, *L. celtifoliella*, *L. celtisella;* on p. 146, *L. Cincinnatiella*, *L. ulmella;* on p. 161 *L? ornatella;* on p. 182 he gives notes on various species; on p. 205 *Leucanthiza? Saundersella*, *Phyllocnistis vitifoliella*, *P. ampelopsiella*, with notes on the species of *Tischeria;* on p. 221 *Laverna cephalonthiella*, with notes on *Aspidisca* and *A. Ella*, n. sp.

H. B. Möschler (Ent. Zeit. Stettin, 375) considers *Gelechia trimaculella* Pack. as = *G. continuella* Zell.

PTEROPHORIDÆ.

C. V. Riley (Rep. Nox. Ins. Missouri, 65) gives an account of the transformations of *Pterophorus periscelidactylus* Fitch, with figures.

P. C. Zeller (Ent. Zeit. Stettin, 179) refers *Pterophorus carduidactylus* Riley to the genus *Platyptilus.*

DIPTERA.

As usual, very little has been written during the year 1871 concerning American insects of this much neglected, and yet most interesting group.

G. J. Bowles (Can. Ent., iii, p. 218) states that a dipterous insect, probably *Trypeta Canadensis* Loew, has been found to injure the fruit of the red and white currant in Canada.

A. S. Packard, Jr. (Amer. Nat., v, p. 744) records the capture of a species of Anthomyia and of Phora in the Mammoth Cave of Kentucky, and figures the former.

A. S. Packard, Jr. (Amer. Nat., iv, p. 690) describes abdominal sense organs in Chrysopila.

A. S. Packard, Jr. (Amer. Jour. of Science and Arts, 3d Series, i, p. 100). On Insects inhabiting Salt-water. Descriptions of some species of dipterous insects inhabiting salt-water are given.

Francis Walker (Can. Ent., iii, p. 141) begins a list of the Diptera of Nova Scotia. No new species are described.

H. Loew[*] (Ent. Zeitung, Berlin, 1869) 8te und 9te Centurie von Beschreibungen nordamerikanischer Dipteren.

C. G. Thompson (Eugenies Resa, 1869) describes several species from California.

MYCETOPHILIDÆ.

H. Loew (Ent. Zeit., Berlin, 1869) describes as new *Ditomyia euzona*, *Plesiastina tristis*, *P. lauta*, *Asyndulum coxale*, *Macrocera hirsuta*, *M. clara*, *M. inconcinna*, *Platyura divaricata*, *P. diluta*, *P. mendica*, *P. mendosa*, *P. melasoma*, *Empheria balioptera*, *E. didyma*, *E. nepticula*, *Polylepta fragilis*, *Sciophila onusta*, *S. obtruncata*, *S. appendiculata*, *S. biseriata*, *S. tantilla*, *Lasiosoma quadratula*, *Eudicrana*, (n. gen. allied to Platyura) *obumbrata*, *Syntemna polyzona*, *Boletina tricincta*, *Phthinia tanypus*, *Elaphyroptera melæna*, *G. decora*, *G. opima*, *G. sublunata*, *G. oblectabilis*, *Leja sororcula*, *L. abbreviata*, *Acnemia psylla*, *Docosia dichroa*, *Rymnosia filipes*, *Trichonta vulgaris*, *T. fœda*, *Zygomyia ignobilis*, *Z. ornata*, *Epicypta pulicaria*, *Mycothera paula*, *Mycetophila*, 13 species, *Sciara sciophila*, *S. ochrolabis*, *Trichosia hebes* from N. America.

Van der Wulp (Tijdschr. Ent. 1869) describes as new *Glaphyroptera lateralis*, Wisconsin.

BIBIONIDÆ.

H. Loew (Ent. Zeit., Berlin, 1869) describes as new *Dilopus breviceps*, from N. H.; *D. obesulus*, District of Columbia; *D. tibialis*, Sitka; *O. dimidiatus*, N. York.

V. der Wulp (Tijdsch. Ent., 1869) describes as new *Bibio senilis*, from Wisconsin.

CHIRONOMIDÆ.

A. S. Packard, Jr. (Amer. Jour. of Sci. and Arts, i, p. 100) figures and describes the larva and pupa of a species of Tanypus from Clear Lake, Lake Co., Cal. It is also stated that Prof. A. E. Verrill dredged a living larva of *Chironomus oceanicus* Pack. from a depth of twenty fathoms.

Van der Wulp (Tijdschr. Ent., 1869) describes as new *Tanypus futilis*, from Wisconsin.

CULICIDÆ.

Van der Wulp, (Tijdschr. Ent. 1869) describes as new *Culex testaceus*, from Wisconsin.

C. G. Thompson (Eugenies Resa, 1869) describes as new *Culex incidens*, from California.

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[*] All the citations of species of Diptera described during 1869 and 1870 are taken from Brauer's "Berichte" and the Zoological Record, as the works themselves have not been received.

TIPULIDÆ.

H. LOEW (Ent. Zeit., Berlin, 1869) describes as new *Longurio* (n. gen.) *testaceus* and *Dixa clavata*, from Mass.

STRATIOMYIDÆ.

A. S. PACKARD. Jr. (op. cit., p. 102) describes and figures the larva and pupa of a species of Stratiomys from Clear Lake, Cal.

H. LOEW (Ent. Zeit., Berlin, 1869) describes as new *Nothomyia* (n. gen.) *calopus*, *N. scutellata*, Cuba; *Nemotelus carbonarius*, Mass.

VAN DER WULP (Tijdschr. Ent., 1869) describes as new *Oxycera picta* and *Sargus marginatus*, Wisconsin.

XYLOPHAGIDÆ.

H. LOEW (Ent. Zeit., Berlin, 1869) describes as new *Xylophagus longicornis*, *X. rufipes* and *X. abdominalis*, from N. America.

VAN DER WULP (Tijdschr. Ent., 1869) describes as new *Subula tenthredinoides*, Wisconsin.

TABANIDÆ.

H. LOEW (Ent. Zeit., Berlin, 1869) describes as new *Phiolina fasciata*, *P. majuscula*, *Pangonia rasa*, and *Lepidoselaga*, (Lepiselaga) *recta*, from N. America.

VAN DER WULP (Tijdschr. Ent., 1869) describes as new *Chrysops æstuans*, from Wisconsin.

ACROCERIDÆ.

H. LOEW (Ent. Zeit., Berlin, 1869) describes as new *Oncodes costatus* and *Opsebius sulphuripes*, from N. America.

BOMBYLIDÆ.

C. G. THOMPSON (Eugenies Resa, 1869) describes as new *Anthrax nudiuscula*, and *A. 5-punctata* from Panama.

H. LOEW (Ent. Zeit., Stett., 1869) describes as new *Geron macropterus*, *G. vitripennis* and *G. albidipennis*, *Anthrax proboscidea*, Sonora, *A. pertusa*, New Mexico, *A. flaviceps*, Tamaulipas, *A. ceyx*, Virginia; *A. fuliginosa*, *A. diagonalis*, *A. molitor*, *A. curta*, California; *A. palliata*, *A. parvicornis*, *A. scrobiculata*, *A. stenozona*, Illinois, *A. sagata*, Matamoras, *A. bigradata*, *A. adusta*, Cuba, *A. nigricauda*, Mass., *A. mucorea*, Nebraska, *Exoprosopa gazophylax*, *E. bifurca*, *E. Agassizii*, California, *E. decora*, Wisconsin, *E. trabalis*, Jalapa, *E. sordida*, Matamoras, *E. Cubana*, *E. nubifera*, *E. parva*, Cuba, *Hemipenthes seminigra*, Saskatchewan, *Argyromœba delila*, California, *A. stellans*, Oregon, *A. obsoleta*, Missouri, *A pauper*, Illinois, *A. euplanes*, Cuba, *A. contigua*, Virginia, *Ploas limbata*, New Mexico.

Van der Wulp (Tijdschr. Ent., 1869) describes as new *Mulio Americanus*, Wisconsin.

SCENOPINIDÆ.

H. Loew (Ent. Zeit., Berlin, 1869) describes as new *Scenopinus albidipennis*, from Cuba.

ASILIDÆ.

V. der Wulp (Tijdsch Ent., 1869) describes as new *Machimus avidus* and *Stilpnogaster anceps*, *Leptogaster flavicornis*, *Dasypogon laticeps*, Wisconsin. The same (1870) *Stenopogon ochraceus*, N. Amer.

THEREVIDÆ.

H. Loew (Ent. Zeit., Berlin, 1869) describes as new *Thereva comata*, *Psilocephala longipes*, *P. melampodia*, *P. munda*, *P. laticornis*, *P. melanoprocta*, *P. costalis*, *P. rufiventris*, *Psilocephala variegata*, *P. scutellaris*, *P. erythrura*, *Thereva albiceps*, *T. flavicincta*, *T. gilvipes*, *T. strigipes*, United States.

LEPTIDÆ.

Van der Wulp (Tijdschr. Ent., 1869) describes as new *Leptis griseola* and *Chrysopila dispar* from Wisconsin.

H. Loew (Ent. Zeit., Berlin, 1869) describes as new *Ptiolina fasciata* and *P. majuscula*, Hudson's Bay.

EMPIDÆ.

H. Loew (Ent. Zeit., Berlin, 1869) describes as new *Empis distans*, Georgia; *E. violacea*, *E. suavis*, Mexico; *E. superba*, Cuba.

Van der Wulp (Ent. Zeit., Berlin, 1869) describes as new *Syneches punctipennis*, Wisconsin.

DOLICHOPIDÆ.

H. Loew (Ent. Zeit., Berlin, 1869) describes as new *Asyndetus ammophilus*, *A. appendiculatus*, *Hydrophorus æstuum*, *Saucropus carbonifer*, from N. America.

C. G. Thomson (Eugenies Resa, 1869) describes as new *Medeterus breviseta*, *Dolichopus lamellicornis*, *D. canaliculatus*, *D. metatarsalis* and *D. aurifer*, from California.

CONOPIDÆ.

C. G. Thompson (Eugenies Resa, 1868) describes as new *Myopa conjuncta*, California.

MUSCIDÆ.

C. V. Riley (Third Rep. on Insects of Illinois, p. 150) describes *Tachina* (*Masicera*) *archippirora* n. sp., parasitic on *Danais Archippus*.

C. V. Riley (op. cit., p, 129) states that he has bred *Exorista leu-*

caniæ Kirkpatrick, from *Attacus Cecropia*, *Datana ministra*, *Agrotis inermis* and two other species of Agrotidians.

HENRY SHIMER (Amer. Nat., v, p. 217) describes *Tachina* (*Melanophora*) *diabroticæ* n. sp., parasitic on *Diabrotica vittata* Fabr., the "Striped cucumber beetle."

VAN DER WULP (Tijdschr. Ent., 1869) describes as new *Echinomyia hæmorrhoa*, *Schineria ruficauda*, *Baumhauria analis*, *Dexia triangularis*, *Aricia cinerella*, *A. proxima*, *Cænosia incisurata*, *Anthomyia tarsata*, *Cordylura maculipennis*, *Sapromyza plumata*, *Herina metallica*, *H. ruficeps*, *Trypeta* (Aciura) *ænea*, *T.* (Tephritis) *cribrata*, *Piophila nitida*, *Agromyza jucunda*, from Wisconsin.

H. LOEW (Ent. Zeit., Berlin, 1869) describes as new *Hydrophorus æstuum*, Rhode Island, *Gymnochæta alcedo*, Mass., *Pyrellia centralis*, Cuba, *P. setosa*, Illinois, *Cænosia tricincta*, *Schænomyza chrysostoma*, *Cordylura gracilipes*, *C. inermis*, *C. glabra*, *C. albibarba*, New Hampshire, *C. scapularis*, English River, *C. munda*, Hudson's Bay Territory, *C. latifrons*, Middle States, *C. gagatina*, Canada, *C. acuticornis*, Hudson's Bay Territory, *C. megacephala*, District Columbia, *Loxocera pectoralis*, Washington, *L. pleuritica*, Conn., New York, *Psila lateralis*, Washington, *P. bivittata*, *P. collaris*, Conn., *P. dimidiata*, Red River, *P. sternalis*, Middle States, *P. levis*, New Hampshire, *Loxocera collaris*, District Columbia, *L. fallax*, Canada, *Chyliza notata*, District Columbia, *Mycetaulus longipennis*, *Oscinis carbonaria*, [District of ?] Columbia, *O. dorsalis*, Rhode Island, *Siphonella reticulata*, Cuba, *Elliponeura debilis*, [District of ?] Columbia, *Rhicnoëssa albula*, *R. parvula*, Rhode Island, *Lobioptera indecora*, Nebraska, *L. leucogastra*, Cuba, *Cacoxenus semiluteus*, Cuba, *Trigonometopus vittatus*, Georgia, *Phytomyza nemosa*, *P. genualis*, District Columbia, *Leucopis simplex*, New York, *Phyllomyza nitens*, Penn., *Agromyza setosa*, District Columbia, *A. simplex*, Middle States, *A. virens*, Penn., *A. magnicornis*, *A. angulata*, Penn., *A. melampyga*, Dist. of Columbia, *A. coronata*, Cuba, Penn., *A. longipennis*, *A. marginata*, [Dist. of?] Columbia, *A. parvicornis*, Washington, *A. neptis*, [Dist. of?] Columbia, *Hydrellia conformis*, *Scatella mesogramma*, Rhode Island, *Callomyia talpula*, New Hampshire, *C. tenera*, New York.

A. S. PACKARD, Jr. (Amer. Jour. Science and Arts, p. 103) describes and figures the larva and pupa of *Ephydra Californica* n. sp., from Clear and Mono Lakes, Cal.; and (p. 105) describes the pupæ of *E. gracilis* n. sp., from Great Salt Lake. The imagos of these species are unknown.

C. G. THOMPSON (Eugenies Resa, 1868) describes as new *Lophosia setigera*, *Echinomyia filipalpis*, *Jurinea echinata*, *Miltogramma erythrocera*, California, *M. biseta*, Panama, *Sarcophaga pallinervis*, Honolulu, California, *Lucilia picicrus*, Panama, *L. stigmaticalis*, *Pyrellia fron-*

talis, *Cyrtoneura 4-setosa*, *C. recurva*, *Anthomyia micropteryx*, *A. ochripes*, *A. ochrogaster*, *Ochtiphila lispina*, *Agromyza pictella*, *A. platyptera*, California, *Ortalis platystoma*, Panama, *Lauxania nasalis*, *planiscuta*, *quadrisetosa*, *Trypeta acutangula*, *T. aurifera*, *T. genalis*, *T. femoralis*, *T. liogaster*, *Sepsis ecalcarata*, *Piophila concolor*, *Hippelates genalis*, *Ephydra pentastigma*, *Notiphila quadrisetosa*, *Drosophila apicata*, *Helomyza limbata*, *Scatophaga thinobia*, California, *Olfersia sulcifrons*, Panama.

SYRPHIDÆ.

Van der Wulp (Tijdschr. Ent., 1869) describes as new *Syrphus signatus* from Wisconsin.

H. Loew (Ent. Zeit., Berlin, 1869) describes as new *Myiolepta varipes*, Virginia, *Orthoneura ustulata*, New Jersey, *Temnocera purpurascens*, Hayti.

C G. Thompson (Eugenies Resa, 1870) describes as new *Syrphus fumipennis*, *S. infumatus*, *S. limbiventris*, *S. sulphuripes*, *S. trichopus*, *Eristalis temporalis*, California.

COLEOPTERA.

Much progress has been made during the year 1871 in the study of that branch of the science especially devoted to the investigation of the habits of Coleoptera and to the dissemination of the knowledge thereby obtained among those to whom such information is of great practical value. The Legislatures of several States have by liberal appropriations greatly aided this advance in knowledge and have seen the wisdom of the course in the good results produced. The results of the observations made have been published in special reports by the States of Massachusetts, Illinois and Missouri under the editorship of A. S. Packard, Jr., M. D., Wm. LeBaron, M. D. and Chas. V. Riley, in the order of the States named.

First Annual Report on the Injurious and Beneficial Insects of Massachusetts, by A. S. Packard, Jr., M. D.

In this pamphlet Dr. Packard notices the habits of *Liopus facetus* Say (injurious to apple trees) and *L. xanthoxyli* Shimer (prickly ash borer) and figures the larva of the latter. *Calli-*

dium amœnum Say is noticed and a figure of the larva given (injures the grape). A figure is given also of the head of *Telephorus bilineatus* (larva) with some notice of its habits, and also the larva of *Galerita janus.*

Third Annual Report on the Noxious, Beneficial and other Insects of the State of Missouri by Charles V. Riley.

This report is the most voluminous of the State reports during the year, and it is to be regretted that Mr. Riley in his very laudable desire of rendering his report popular has been led into error by some of his very sweeping generalizations. On pp. 9 and 10 Mr. Riley says, "it (the family Curculionidæ) is at once distinguished from all the other families of beetles, by the front of the head being produced into a more or less elongated snout or rostrum at the extremity of which the mouth is situated." The snout is by no means characteristic of, nor peculiar to, the family or rather section *Rhÿnchophora*, as may be seen among many *Scolytidæ* with no snout, while among some *Œdemeridæ* (*Rhinoplatia* Horn), *Mycteridæ* (*Mycterus*) and *Pythidæ* (group *Salpingini*) a very distinct and quite elongated snout exists. Even in a popular publication accuracy should never bend to popularity.

Page 11. *Conotrachelus nenuphar* Hbst., figures of larva, pupa and imago, with remarks on their habits. Plum trees.

Page 29. *Anthonomus quadrigibbus* Say, notes as above.

Page 35. *Conotrachelus cratægi* Walsh, figure of imago. Quince.

Page 39. *Anthonomus prunicida* Walsh, figure of imago. Plum.

Page 42. *Analcis fragariæ* Walsh, imago and larva. Strawberry.

Page 45–52. Remarks on *Bruchus pisi* Linn. and *granarius* Linn., both imported species.

Page 52. *Bruchus fabæ* Riley, figure of imago. Bean.

Page 57. *Ithycerus curculionoides* Hbst., figure of larva and pupa, erroneously named in this *Noveboracensis*, the latter name being accepted as a synonyme. Injures usually stone fruit.

Page 58. *Epicœrus imbricatus* Say, figure of imago. Apple, cherry, etc.

Page 59. *Sphenophorus zeœ* Walsh., figure of imago. Injures maize.

Page 60. *Sphen. pulchellus* Schon., figure of imago.

Page 77. *Pelidnota punctata* Linn., figured in various stages.

Page 79. *Haltica chalybea* Illig., figured in all its stages. Grape vine.

Page 81. *Colaspis flavida* Say, figure of imago. Grape.

The remarks on the habits of the above mentioned Coleoptera in their various stages of development are full, clear and to the point. It is to be hoped that the tendency shown among practical entomologists, of borrowing each other's woodcuts and entire articles may be checked. The remark is not intended to be applied to the present pamphlet, as it is rather the "sinned against" than "sinning."

First Annual Report on the Noxious Insects of the State of Illinois, by Wm. LeBaron, M. D.

Page 63. *Doryphora decemlineata* Say. This article is illustrated by a very familiar woodcut. A list of insects is given known or supposed to be detrimental to the increase of the *Doryphora*, two of which are doubtful, viz.: *Lytta vittata* and *cinerea*, which, however, are properly *Epicauta*, and are probably not at all predaceous, but are on the contrary occupied in a manner similar to the *Doryphora* itself. (See Canad. Ent., iii, p. 138.)

Monthly Report of the Department of Agriculture. Entomological Record. By Townend Glover.

Canadian Entomologist. Edited by Rev. C. J. S. Bethune, M. A. Continuations of the reprint of Kirby's Fauna Boreali Americana, by the editor in Nos. ii, v, vi, vii, viii, ix, x, xi, xii.

Pages 41–51. Report of Messrs. W. Saunders and E. B. Reed on the Colorado Potato Beetle.

Page 105. List of Coleoptera, taken at Grimsby by J. Pettit, enumerating over one hundred Cerambycidæ, without, however, completing the list.

Synonymical Notes on North-American Coleoptera, by John L. LeConte, M. D., Philadelphia. In the Annals and Magazine of Nat. Hist., London, Nov. 1870. Not properly an American publication, but included in the Record as part of the progress of Entomology in the United States, from the subject and author. It contains

I. Review of the types of Kirby (Fauna Boreali-Americana).

II. " " " " " Newman.

III. " " " " " Walker (Nat. in Brit. Col., London, 1866).

IV. Review of types in Parisian collections.

Many points of synonymy long in doubt have here been settled and it is hoped finally.

Transactions of the American Entomological Society, Vol. ii, Philadelphia, 1871.

The following papers on Coleoptera are published:

Synopsis of the species of Corphyra Say, of the United States, by Geo. H. Horn, M. D.

Synopsis of Aphodiini of the United States, by Geo. H. Horn, M. D.

Remarks on the species of the Genus Isomalus of the United States by Geo. H. Horn, M. D.

Descriptions of new species of Elateridæ of the United States by Geo. H. Horn, M. D.

Descriptions of new Coleoptera of the United States, with notes on known species, by Geo. H. Horn, M. D.

Synonymy noticed in the papers cited. Synonymes in italics.

1st. From Kirby's types (Fauna Boreali-Americana), British Museum. By Dr. LeConte.

Cicindela obliquata Kby = vulgaris Say; *Elaphrus* Clairvillei Kby = *politus* Lec.; *Elaphrus* intermedius Kby = *Californicus* Mann.; *Anchomenus angusticollis* Kby = *Platynus* stygicus Lec.; *Agonum seminitidum* Kby = cupreum Dej. = *chalceum* Lec.; *Argutor bicolor* Kby = *Pterostichus* patruelis Dej.; *Amara* discors Kby = *gibba* Lec.; *Chlœnius* quadricollis Kby = *brevilabris* Lec.; *Chlœnius impunctifrons* Kby = Pensylvanicus Say; *Chlœnius* cordicollis Kby = *chlorophanus* Auct.; *Chlœnius chlorophanus* Dej. = solitarius Say; *Harpalus* laticollis Kby = *Anisodactylus Harrisii* Lec.; *Harpalus* basilaris Kby = *obesulus* Lec.; *Peryphus sordidus* Kby = bimaculatus Kby; *Laccophilus biguttatus*

Kby = proximus Say = *Americanus* Aubé; *Necrophorus* obscurus Kby = *Melsheimeri* Lec; *Necrophorus Melsheimeri* Kby = Sayi Lap. = *lunatus* Lec; *Necrophorus* pygmæus Kby=? *defodiens* Mann.; *Cryptophagus* concolor Kby = *Triphyllus ruficornis* Lec ; = *humeralis* Kby; *Byrrhus concolor* Kby = Cytilus; *Byrrhus picipes* Kby = geminatus Lec.; *Telephorus mandibularis* Kby = fraxini Say; *Leptura longiceps* Kby = *Acmæops* strigillata (Fab.); *Leptura* longicornis Kby = *Acmæops marginalis* Lec.

2d. From types of Newman, British Museum.

Feronia mœrens Nm. = *Pterostichus flebilis* Lec. = *adjunctus* Lec.; *Feronia picipes* Nm. = *Pterostichus* stygicus (Say); *Feronia atrata* Nm. = *Pterostichus* permundus Say; *Feronia* orbata Nm. = *Evarthrus conviva* Lec.

3d. Types of Mr. Walker ("Naturalist in British Columbia," Lord, 1866, Vol. ii, appendix), British Museum.

Calosoma irregulare W. = tepidum Lec.; *Callisthenes pemelioides* W. = *Calosoma Zimmermanni* var. = luxatum Say; *Carabus bicolor* W. = *Calosoma* laqueatum Lec.; *Amaseus colligatus* W. = *Pterost.* Oregonus Lec.; *Amara extensa* W. = *Harpalus* sp.? *Amara communis* W. = impuncticollis Say; *Peryphus æqualis* W. = *Bembid.* planatum Lec.; *Laccophilus maculosus* W. = decipiens Lec.; *Atemeles reflexus* W. = cavus Lec.; *Tropisternus binotatus* W. = *Hydrophilus* limbatus Lec.; *Saprinus consimilis* W. = Oregonensis Lec.; *Necrophorus conversator* W. = pollinctor Lec.; *Cremastochilus armatus* W. = angularis Lec.; *Anomala contermina* W. = *Lachnosterna* tristis ? Kn.; *Rhizotrogus collocatus* W. = *Phobetus* testaceus Lec.; *Ancylonycha nigropicea* W. = *Diplotaxis* brevicollis Lec.; *Ancylonycha consequens* W. = *Diplotaxis* sp.? *Ancylonycha uninotata* W. = *Lachnosterna* sp.? *Serica crassata* W. = anthracina Lec.; *Ancylochira ornata* W. = Langii Mann.; *Adelocera vetusta* W. = profusa Cand. = *cavicollis* Lec.; *Athous quadrivittatus* W. = *Corymbites* lateralis Lec. (immature); *Diacanthus semimetallicus* W. = *Corymb.* æripennis Kby; *Clerus sobrius* W. = sphegeus Fab.; *Iphthemus servilis, servator, subligatus* W. = races of serratus Mann.; *Eleodes convexicollis* and *conjuncta* W. = obscura Say; *Eleodes binotata* W. = hispilabris Say; *Eleodes latiuscula* W. = probably humeralis Lec.; *Helops inclusus* W. = either lautus or pernitens Lec; *Nemognatha bicolor* W. = apicalis Lec.; *Eutrypanus princeps* W. = *Ædilis* spectabilis Lec.; *Typocerus cervinus* W. = Toxotus *spurcus* Lec.; *Toxotus perductor* W. = *Leptura* obliterata Hald.; *Clythra bisignata* W. = *Saxinis* saucia Lec.

4th. Types in the collections in Paris.

Amblychila Piccolominii Reiche = cylindriformis Say; *Cicindela* blanda Dej = *tarsalis* Lec.; *Omophron nitens* Chaud. = nitens Lec. *Cychrus Germari* Chaud. = Andrewsii Harris; *Cychrus granulosus*

Chaud. = Lecontei Dej. var. *Brevoorti* Lec.; *Cychrus Schaumii* Chaud. = nitidicollis Chev.; *Pasimachus viridans* Lec. = Mexicanus Gray; Anisotarsus Chaud. = *Eurytrichus* Lec.; *Dacnochilus lætus* Lec. = angularis Er.; *Lispinus rufescens* Lec. = Ancæus.

New synonymy in Elateridæ, etc. By Dr. Horn.

Limonius discicollis Cand. = maculicollis Motsch. Trans. Amer. Ent. Soc., p. 316. *Limonius humeralis* Cand. = ornatulus Lec. Trans. Amer. Ent. Soc., p. 316. *Corymbites Nebraskensis* Bld. = triundulatus Rand. Trans. Amer. Ent. Soc., p. 322. *Corymbites diversicolor* Esch. = rotundicollis Say. Trans. Amer. Ent. Soc., p. 323. *Corymbites lateralis* Lec. = var. carbo Lec. Trans. Amer. Ent. Soc., p. 323. *Cyclocephala robusta* Lec. = nigricollis Burm. Trans. Amer. Ent. Soc., p. 334. *Anelpistus Americanus* Horn = Scotodes *Americanus*, l. c., p 343.

The following list comprises the new genera and species:—

CICINDELIDÆ.

Geo. H. Horn. (Trans. Amer. Ent. Soc.) *Cicindela puritana*, p. 325, N. Hamp. and Mass.

CARABIDÆ.

Geo. H. Horn. (Trans. Amer. Ent. Soc.) *Chlænius viduus*, p. 325, Missouri; *C. orbus*, p. 326, Texas; *C. alternatus*, p. 327, Saskatchewan. *Anophthalmus tenuis* and *eremita*, pp. 327 and 328, Wyandotte Cave, Indiana.

DYTISCIDÆ.

Geo. H. Horn. (Trans. Amer. Ent. Soc.) *Suphis lineatus*, p. 329, Lower Cal.; *Laccophilus quadrilineatus*, p. 330, Texas; *Colymbetes inæqualis*, p. 330, Cal. and Oregon. *Laccophilus pictus* Cast., Texas, and *Colymbetes coriaceus* Cast., Canada, are noticed for the first time in our fauna, p. 330.

HYDROPHILIDÆ.

Geo. H. Horn. (Trans. Amer. Ent. Soc.) *Hydrophilus quadristriatus*, p. 331, New Jersey.

STAPHYLINIDÆ.

Geo. H. Horn. (Trans. Amer. Ent. Soc.) *Phytosus littoralis*, p. 331, New Jersey; *Quedius spelæus*, p. 332, Wyandotte Cave, Indiana; *Eleusis (Isomalus) Canadensis*, p. 299, Canada; *Glyptoma brevicristatum*, p. 332, Arizona. *Pseudopsis sulcatus* Nm., Canada, is noticed in our fauna, previously known only from England, p. 333.

HISTERIDÆ.

Geo. H. Horn. (Trans. Amer. Ent. Soc.) *Saprinus æneipunctatus*, p. 333, California coast.

SCARABÆIDÆ.

Geo. H. Horn. (Trans. Amer. Ent. Soc.) *Bradycinetus* n. g., in place of *Amechanus*, p. 334; *Aphodius ochreipennis* and *rugifrons*, p. 295, California; *Oxyomus opacifrons*, p. 284, Middle States; *Atænius robustus*, p. 285, Missouri; *oblongus*, p. 286, California; *ovatulus*, p. 286, Penn. to Louisiana; *lobatus*, p. 287, Lower California; *socialis*, p. 288. Georgia; *hirsutus*, p. 288, Ariz.; *lucanus*, p. 288, Lower Cal.; *cylindrus*, p. 289, Gulf States; *desertus*, p. 289, Colorado Desert; *Rhyssemus Californicus*, p. 290, Cal.; *riparius*, p. 290, Ariz.; *Psammodius quinqueplicatus*, p. 292, Ariz.; *bidens*, p. 293, Georgia; *Ægialia conferta*, p. 294, Middle and South. States; *Cyclocephala elegans*, p. 337, Texas and Lower Cal.; *Cotalpa consobrina*, p. 337, Ariz.; *Osmoderma socialis*, p. 338, Ariz.; *Cremastochilus depressus*, p. 340, *pilosicollis*, p. 341, Cal.

ELATERIDÆ.

Geo. H. Horn. (Trans. Amer. Ent. Soc.) *Meristhus cristatus*, p. 299, Lower Cal.; *Texanus*, p. 300, Texas; *Cardiophorus togatus*, p. 301, Texas; *Edwardsi*, p. 301, Cal.; *æneus*, p. 301. Cal.; *Horistonotus definitus*, p. 302, Cal.; *Uhlerii*, p. 302, Florida; *Coptostethus Americanus*, p. 303, Louisiana; *Cryptohypnus Sanborni*, p. 303, New Hampshire; *æstivus*, p. 304, Missouri; *perplexus*, p. 304, D. C.; *dubius*, p. 305, Dacota; *colon*, p. 305, Cal.; *Elater atripennis*, p. 306, Cal.; *Behrensi*, p. 306, Cal.; *cordatus*, p. 306, Cal.; *Elatrinus* (n. g.) *anthrax*, p. 307, Cal.; *Drasterius grandicollis*, p. 308, Cal.; *marginicollis*, p. 308, Cal.; *Megapenthes aterrimus*, p. 309, Cal. and New Mexico; *elegans*, p. 310, Cal.; *Rogersi*, p. 310, Canada; *Anchastus desertus*, p. 311, Colorado Desert; *sericeus*, p. 311, Ariz.; *Monocrepidius robustus*, p. 312, Ariz.; *mutuus*, p. 312, Ariz.; *Ludius Lecontei*, p 313, Cal.; *Limonius quadrimaculatus*, p. 313, Cal ; *Ulkei*, p. 314, Cal.; *cribricollis*, p. 314, Cal.; *nitidulus*, p. 315, Cal.; *Athous axillaris*, p. 316, Cal.; *flavangularis*, p. 317, Vermont; *Agriotes protractus*, p. 317, Cal.; *Oxygonus ater*, p. 318, Cal.; *Corymbites xanthomus*, p. 319, Cal.; *monticola*, p. 319, Cal.; *limoniiformis*, p. 320, Dacota; *pruininus*, p. 320, Cal. and Nev.; *Breweri*, p. 321, Cal.; *præses*, p. 321, Montana; *obversus*, p. 322, Cal.

CLERIDÆ.

Geo. H. Horn. (Trans. Amer. Ent. Soc.) *Clerus repandus*, p 342, Cal. to Iowa; *Hydnocera albocincta*, p. 342, Texas.

OTHNIIDÆ.

Geo. H. Horn. (Trans. Amer. Ent. Soc.) *Elacatis longicornis*, p. 334, Fort Yuma, Cal.

EUCNEMIDÆ.

Geo. H. Horn. (Trans. Amer. Ent. Soc.) *Xylobius cylindriformis*, p. 341, California.

ANTHICIDÆ.

Geo. H. Horn. (Trans. Amer. Ent. Soc.) *Corphyra vittata*, p. 279, Cal.; *funebris*, p. 280, Cal.; *Lewisii*, p. 281, Colorado.

EROTYLIDÆ.

Geo. H. Horn. (Trans. Amer. Ent. Soc.) *Triplax aulica*, p. 348, Missouri.

BRUCHIDÆ.

Chas. V. Riley. (Third Annual Report, Missouri) *Bruchus fabæ*, p. 55, U. S.

RHYNCHOPHORA.

Chas. V. Riley. (Third Annual Report, Missouri) *Analcis fragariæ*, p. 44, Missouri and Illinois; *Sphenophorus zeæ* Walsh, p. 59, Mo. and Ill.

CERAMBYCIDÆ.

T. Glover (Month. Rpt. Dep. Agric., 477) notices (with a figure) the habits of *Oncideres cingulatus* Say, and *Elaphidion villosum* (Fabr.)

T. Glover (Month. Rpt. Dep. Agric., 479) gives an account of the habits of *Anthonomus signatus* Say.

HEMIPTERA.

Dr. Asa Fitch (13th Report on the Insects of the State of New York, Agricult. Society for 1869), details the habits of *Phytocoris lineatus* Fab., recounts the different plants infested by various *Aphids*, and describes an apparently new species, *A. circezandis.*

Townend Glover (Monthly Report of the Department of Agriculture; October, 1871), records some of the habits and characteristics of *Erythroneura vitis* Harris, and of another species (name not given), and states the remedies employed to check their depredations.

E. B. Reed (Canadian Entomologist, p. 170), notes *Perillus circumcinctus* Staal, as one of the destroyers of the Colorado potato beetle; and with Mr. W. Saunders, l. c. p. 49, reports *Sinea raptatoria* Say to be an enemy of that beetle in its larval state.

Dr. W. LeBaron (First Annual Report on the Noxious Insects of Illinois, 1871), notes the habits of *Phytocoris quadrivittatus* Say (it is the *Capsus lineatus* Fab.), and gives an interestingly detailed account of *Mytilaspis conchiformis* Gmelin, and of *Mytilaspis pinifoliæ* Fitch.

C. V. Riley (Third Annual Report on the Insects of Missouri, 1871), notices the carnivorous propensities of *Campyloneura vitripennis* Say, and gives woodcuts of the adult and young. He also notes the sawing and rasping of apple tree limbs by the Cicadas, *C. septendecim* and *C. tredecim*, and by treehoppers and other Homoptera; and furnishes a valuable account, with figures, of the pernicious pest of the grapevines, *Phylloxera vitifoliæ* Fitch, which he shows to be almost, if not quite, identical with *P. vastatrix* Planchon, the species so destructive to the vines in France.

Dr. Carl Staal (Hemiptera Fabriciana, 1868, received too late for notice in our former report), has critically investigated the still extant types of the Fabrician descriptions, and has given careful and ample diagnoses of the insufficiently described forms; thus making recognizable many species which could not formerly be determined.

P. R. Uhler (Proceedings Boston Society Natural History, Feb., 1871), describes and notices several species belonging to the collection of Dr. T. W. Harris; and in Dr. Packard's paper "On Insects Inhabiting Salt Water" (Amer. Jour. Sci. and Arts, Third Series, Vol. I), describes two new species of aquatic Heteroptera, and notices the habits of a marsh-frequenting *Salda*. He also gives a list of Colorado species in Dr. Hayden's Report on the Territories, 1871.

Francis Walker (Catalogue of Heteropterous Hemiptera in the British Museum, Pts. I, II, IV, 1867-'71), gives a list of the species belonging to the collection of the British Museum, and describes several apparently new species from North America.

(HETEROPTERA.)

SCUTELLERIDÆ.

C. STAAL (Hemipt. Fabr., pp. 13–14, cites *Tetyra arcuata* Fab., *Diolcus irroratus* Fab., and *Symphylus affinis* Fab. from the islands north of South America.

P. R. UHLER (Boston Soc. Proc., p. 1), describes the new genus *Aulacostethus*, and places in it *Tetyra marmorata* Say.

F. WALKER (British Mus. Cat., pt. 1) describes *Phimodera torpida*, p. 75, from Saskatchewan; *Corimelæna cyaneonigra*, p. 78, Mexico; *Oplomus biarcuatus*, p. 121, Vera Cruz; *Platynopus conspersus*, p. 123, Orizaba, and notices *Augocoris Ehrenbergii*, *A. gigas*, *A. Gomesii* from Mexico; *A. pallidus*, *A. cretaceus*, Cuba; *Pachycoris Klugii*, *P. variabilis*, *P. Boscii*, *P. marginellus*, *P. luminosus*, *P. dissociatus*, *P. farctus*, *P. guttipes*, *P. conicus*, *P. sticticus*, Mexico; *P. chrysorrhœus*, *P. guttatus*, Carolina; *P. nitens*, *P. obliquus*, *P. arcuatus*, *P. cassidioides*, *P. delineatus*, *P. pinguis*, W. Indies; *Homœmus exilis*, Nova Scotia; *H. parvulus*, Florida; *H. punctellus*, *H. proteus*, Mexico; *Symphylus irroratus*, *S. variegatus*, *S. Knochii*, W. Indies; *Agonosoma rubrocincta*, *A. flavocincta*, *A. Mexicana*, Mexico; *Zophœssa porosa*, *Z. mœsta*, *Z. socia*, California and Mexico; *Eurygaster alternatus*, N. America; *Podops dubius*, Florida; *Corimelæna nitiduloides*, *C. unicolor*, *C. nigra*, *C. pulicaria*, *C. lateralis*, *C. marginella*, United States; *C. Schulzii*, *C. signatipennis*, Mexico; *C. basalis*, W. Indies; *Megaris atratula*, *Stiretrus cœruleus*, *S. lythrodes*, *S. ornatus*, *S. pulchellus*, *S. flavipes*, *S. atricapillus*, *S. crucifer*, Mexico; *S. violaceus*, *S. anchorago*, *S. fimbriatus*, United States; *Oplomus catena*, *O. nigripennis*, *O. pulcher*, *O. salamandra*, *O. dichrous*, *O. mundus*, *O. mutabilis*, *O. proteus*, *O. confluens*, *O. virgatus*, *O. circumcinctus*, *Platynopus rhodomelas*, Mexico.

PENTATOMIDÆ.

C. STAAL, l. c., gives diagnosis of *Chlorocoris depressus* Fab., p. 23, from Central America, also cites *Proxys victor* Fab., p. 25, W. Indies; *Berecynthus delirator* Fab., p. 26, W. Indies; *Euschistus crenator* Fab., p. 26, W. Indies; *Œbalus typhœus* Fab., p. 27, Carolina; *Cosmopepla carnifex* Fab., p. 28, North America; *Thyanta perditor* Fab., p. 29, W. Indies; *Nezara viridula* Linn., p. 31, W. Indies; *Edessa meditabunda* Fab., p. 37, W. Indies.

P. R. UHLER, l. c., describes *Podisus serieventris*, p. 2; *Brochymena Harrisii*, p. 3; *Euschistus fissilis*, p. 4; *Lioderma*, new genus, including *Pentatoma saucia* Say and *P. senilis* Say, p. 5; *Atomosira sordida*, new genus and sp., pp. 5 and 6, and refers *Trichopepla semivitta* Say, *Neot-*

tiglossa undata Say and *Rhaphigaster Pensylvanicus* Degeer, all from New England, to their appropriate genera.

F. Walker, l. c., describes *Arma invaria*, p. 135, *A. monospila* and *A. colorata*, p. 136, from Mexico; *Cyrtomenus crassus*, p. 147, Vera Cruz; *Æthus subglaber*, p. 150, North America; *Æ. fusiformis*, *Æ. fortis*, *Æ. tenuis*, p. 151, Mexico; *Discocephala inobtrusa*, p. 183, Mexico; *Ochlerus guttipes*, p. 193; *Brochymena tenebrosa*, p. 231, both Mexico; *Loxa nigridens*, p. 241, Saint Domingo; *Euschistus fasciatus*, *E. lineatus*, p. 245, Mexico; *E. acuminatus*, *E. reductus*, p. 246, Saint Domingo; *Eysarcoris punctifer*, p. 274, California; *Hymenarcys viridicatus*, p. 283; *Pentatoma marginalis*, p. 288; *Strachia angularis*, p. 315, N. America; *S. placens*, p. 316, Saint Domingo; *Vulsirea transducta*, p. 352; *V. lativentris*, p. 353, Mexico; *Rhaphigaster imbutus*, p. 358, Vera Cruz; and *R. aggressor*, p. 359, W. Indies. He records the following from the localities here given: — *Mutyca phymatophora*, Mexico; *Arma grandis*, *A. spinosa*, *A. modesta*, *A. pallens*, North America; *A fuscescens*, *A. didyma*, *A. pulchricornis*, *A. congrex*, *A. Delia*, *A. cole*, *A. Thetis*, Mexico; *Euthyrhynchus punicus*, *E. floridanus*, *Apateticus halys*, *Tynacantha punctipennis*, Mexico; *Zicrona cuprea*, *Z. marginella*, from Hudson's Bay region; *Z. splendida*, California; *Cyrtomenus castaneus*, *C. mutabilis*, North America; *C. emarginatus*, Mexico; *Æthus bilineatus*, *Æ. rugifrons*, *Æ. femoralis*, North America; *Æ. margo*, *Æ. piceatus*, Mexico; *Æ. curvipes*, *Æ. insularis*, W. Indies; *Amnestus spinifrons*, New York; *Sehirus ligatus*, N. America; *Discocephala notulata*, *D. clypeata*, Mexico; *Ochlerus cinctus*, *O. tartareus*, *Antiteuchus obscurus*, *A. luctuosus*, *Chlorocoris rufispinus*, *C. atrispinus*, Mexico; *Brochymena annulata*, *B. serrata*, *B. quadripustulata*, *B. Carolinensis*, United States; *B. lineolata*, *B. hædula*, Mexico; *Loxa flavicollis*, West Indies; *Euschistus crassus*, *E. inconspectus*, *E. ictericus*, *E. punctipes*, *E. luridus*, *E. tristigma*, United States; *E. obscurus*, *E. bifibula*, *E. spurculus*, *E. biformis*, *E. strenuus*, *E. castus*, Mexico; *E. pallipes*, *E. crocipes*, West Indies; *Proxys victor*, *P. delirator*, *P. variolarius*, *P. crenatus*, Mexico and West Indies; *Mormidea pœcila*, *M. pyrrhocera*, United States; *M. collaris*, *M. notulata*, *M. irrorata*, *M. pictiventris*, *M. lugens*, *M. hamulata*, *M. angustata*, *M. verrucifera*, Mexico; *M. croceipes*, *M. cubrosa*, West Indies; *Ælia trilineata*, *Æ. Americana*, North America; *Eysarcoris conspicillaris*, *E. carnifex*, United States; *E. decoratus*, Mexico; *Hymenarcys nervosa*, *H. perpunctata*, *H. æruginosa*, North America; *Pentatoma picea*, *P. dubia*, *P. boxura*, *P. grisea*, *P. pilipes*, *P. lugens*, *P. custator*, *P. dentata*, *P. pallidovirens*, United States; *P. obsoleta*, Jamaica; *Strachia histrionica*, United States; *S. munda*, *S. splendida*, *S. principalis*, *S. melanopyga*, *S. rufo-notata*, Mexico; *S. violascens*, *S. perspicua*, *S. proxima*, W. Indies; *Vulsirea liturata*, *V. anchorago*, *V. variegata*, *V. nigrorubra*,

W. Indies; *Rhaphigaster prasinus*, *R. sarpinus*, *R. catinus*, *R. punctulatus*, N. America; *R. spirans*, *R. sticticus*, *R. marginatus*, *R. jurgiosus*, *R. nitidiventris*, Mexico; *R. sparnius*, *Arvelius albo-punctatus*, W. Indies; *Taurocerus edessoides*, *T. Achilles*, *T. Hector*, Mexico; *Acanthosoma cruciata*, *A. nebulosa*, North America.

COREIDÆ.

C. STAAL, l. c., cites *Archimerus calcarator* Fab., *Euthoctha galeator* Fab. from Carolina; *Leptoglossus albicinctus* Say, warm parts of America; *Spartocera fusca* Thunb., Guadeloupe; *Anasa scorbutica* Fab., W. Indies; *A. tristis* DeGeer., Carolina; *A. Uhleri* Staal, Mexico; *A. apicalis* Westw., Mexico; *A. armigera* Say, N. America; *Catorhintha guttula*, Fab., W. Indies; *Gerris filiformis* Fab., Cuba; *Harmostes serratus*, Fab., W. Indies; *Corizus lineata* Fab., *C. hyalinus* Fab., *C. sidæ* Fab., W. Indies.

P. R. UHLER, l. c., describes as new species, *Metapodius instabilis* and *M. confraternus*, p. 7, from North Carolina and Florida; and *Neides decurvatus*, p. 8, from New Hampshire.

F. WALKER, l. c., pt. IV, cites *Sephina maculata*, Jamaica; *S. vinula*, *S. limbata*, Mexico; *Spartocera dorsalis*, *S. fusca*, *S. gigas*, Mexico; *Mictoides*, new genus, same as *Sagotylus* Mayr, with the same species as employed by Dr. Mayr, viz:—*Mictis triguttatus* H. Schf. The specific name has however been set aside by the earlier appellation by Say; thus the correct name will now be *Sagotylus confluentus* Say, from Mexico; *M. ozena*, *M. spinicrus*, Mexico; *Metapodius femoratus*, *M. terminalis*, N. America; *M. constrictus*, W. Indies; *M. suratus*, *M. thoracicus*, *M. granulosus*, *M. luctuosus*, Mexico; *Pachylis gigas*, *P. Hector*, Mexico; *Melucha quadrivittata*, Mexico; *Archimerus calcarator*, *A. rubiginosus*, United States; *A. affinis*, *A. triangulum*, W. Indies; *A. lunatus*, *A. affinis*, *A. lineolatus*, *A. Nestor*, *A. scrupulosus*, *A. scutellaris*, Mexico; *Capaneus multispinus*, *C. Achilles*, *C. auriculatus*, *C. rubronotatus*, *C. vates*, *C. tetricus*, *C. odiosus*, *C. spurcus*, *C. ventralis*, Mexico; *Mamurius Mopsus*, Mexico; *Meropachys alternatus*, Mexico; *Flavius lineaticornis*, *F. pinguis*, *Nematopus lepidus*, Mexico; *Paryphes Whitei*, Cuba; *P. imperialis*, *Scamurius jurgiosus*, *Anasa scorbutica*, *A. Andresii*, *A. nigripes*, *A. bellator*, Mexico and W. Indies; *A. armigera*, *A. obliqua*, *Chariesterus antennator*, United States; *C. mœstus*, Mexico; *Hymenophora crucifer*, *H. lobatus*, W. Indies; *Euthochtha galeator*, *Corynocoris distinctus*, United States; *Sagotylus triguttatus*, Mexico (noticed above); *Diactor rufus*, *Anisoscelis scripta*, *A. minor*, *A. gonagra*, *A. lineosa*, *A. zonata*, Mexico; *A. albicincta*, *A. opposita*, *A. corcula*, United States; *Narnia femorata*, Mexico; *N. pallidicornis*, Texas; *Pthia lunata*, *P. picta*, *Cebrenis pulchella*, *Sphictyrtus pretiosus*, *Hypselonotus fulvus*, *H. interruptus*, *H. concinnus*, *H. lineatus*, *H. punc-*

tiventris, Mexico; *Jadera sanguinolenta*, W. Indies; *J. æola*, Mexico; *Alydus calcaratus*, *A. cruentus*, *A. pilosulus*, *A. ater*, *A. apicalis*, *A. curtulus*, United States; *A. notatipennis*, *Camptopus diversipes*, *C. pallens*, Mexico; *C. affinis*, *C. rufipes*, W. Indies; *Protenor Belfragii*, *Darmistus subvittatus*, Mexico; *Leptocorisa filiformis*, *L. tipuloides*, *Lyrnessus tibialis*, W. Indies; *Neides spinosus*, *N. decurvatus*, *N. gracilipes*, United States; *Xiphares tabulatus*, Mexico; *Gonocerus affiliatus*, *G. tristis*, *G. obsoletus*, United States; *G. apicalis*, Mexico; and describes as new, *Sephina atra*, p. 4, *Spartocera lampyroides*, p. 6, *Archimerus acutiusculus*, and *A. indecorus*, p. 64, *A. guttiventris*, *A. maculifer*, p. 65, *A. dolosus*, p. 66, *Hirilcus collaris*, p. 73, from Mexico; *Anisoscelis selecta*, p. 127, St. Domingo; *A. præcipua*, *A. concolor*, p. 128, *Pthia concinna*, p. 132, *Hypselonotus propinquus*, p. 142, *H. armatus*, p. 144, and *Gonocerus capaneodes* var. p. 186, from Mexico.

LYGÆIDÆ.

C. Staal, l. c., cites *Lygœus aulicus* Fab., St. Barthelemy; *L. pulchellus* Fab., *L. collaris*, Fab., W. Indies; *L. turcicus* Fab., New York, and places the Fabrician species in several new subgenera.

P. R. Uhler, l. c., describes as new *Plociomerus diffusus*, p. 9, *Ozophora* new genus, *O. picturata*, p. 10; *Peritrichus fraternus*, p. 11 and *Belonochilus* new genus, from Massachusetts, and notes the synonymy of *Ptochiomera nodosa* Say, Alabama; *Plociomerus constrictus* Say, Mass.; and *Eremocoris ferus* Say, Mass.

TINGIDÆ.

C. Staal, l. c., p. 95, notices *Tingis sacchari* Fab., from W. Indies, and *Galeata gossypii* Fab., W. Indies.

PYRRHOCORIDÆ.

C. Staal, l. c., notices *Largus succinctus* Fab., Pennsylvania; *Dysdercus Andreæ* Linn. = *suturalis* Fab. West Indies. This species swarms on the cotton in Hayti, staining it red, and doing otherwise much mischief to the plant.

ANTHOCORIDÆ.

P. R. Uhler, l. c., p. 14, notes *Lyctocoris domesticus* and *Triphleps insidiosus* and their synonymy, from North Carolina, etc.

REDUVIDÆ.

C. Staal, l. c., p. 97, notes *Sinea multispinosa*, DeGeer, from N. America; *Milyas cinctus* Fab., N. America; *Apiomerus crassipes* Fab., Carolina; *Sirthenea carinata* Fab., Carolina; *Leogorris litura* Fab., Mexico; *Pnirontis languida*, *P. infirma*, Carolina; *Stenopoda culiciformis* Fab., Cuba.

P. R. UHLER, l. c., p. 14-15, notices *Pygolampis pectoralis* Say; *Emesa longipes* DeGeer, and *Ploiaria errabunda* Say, from New England, and gives their synonymy.

CAPSINI.

A. FITCH, l. c., p. 513 seq., describes the appearance of *Phytocoris lineatus* Fab., and notices its ravages upon dahlias and other flowers.

W. LEBARON, l. c., p. 61, gives some account of the habits of the species just noticed by Dr. Fitch, calling it *Capsus quadrivittatus* Say. This name is a synonyme of the above, and the species belongs to the modern genus *Lygus* Fieber.

C. V. RILEY, l. c., p. 137, notes the habits of *Campyloneura vitripennis* Say.

C. STAAL, l. c., p. 86, gives a diagnosis of *Capsus lineatus* Fab., and refers it to the genus *Calocoris*.

PHYMATIDÆ.

C. STAAL, l. c., p. 94, notices *Macrocephalus cimicoides*, *M. prehensilis*, from Carolina, and *Phymata marginata* Fab., with a diagnosis, from W. Indies.

ARADIDÆ.

P. R. UHLER, l. c., pp. 13 and 14, describes as new, *Aradus robustus*, *Aneurus inconstans*, and *A. simplex*, from New England.

SALDÆ.

P. R. UHLER, in Dr. Packard's paper, noticed above, reports *Salda interstitialis* Say, from Clear Lake, California.

HYDROESSÆ.

P. R. UHLER, l. c., p. 15, describes *Rhagovelia obesa*, new species, from the United States.

HYDROMETRIDÆ.

P. R. UHLER, in Dr. Packard's paper, describes as new *Hygrotrechus robustus*, from Clear Lake, California. And in l. c., he gives the characters of a new genus and species, *Metrobates hesperius*, p. 17, from the United States and W. Indies.

GALGULIDÆ.

C. STAAL, l. c., notes *Galgulus oculatus* Fab., from Carolina and Texas.

NOTONECTIDÆ.

C. **Staal**, l. c., p. 137, redescribes *Anisops pallipes* Fab., from the W. Indies.

CORISÆ.

C. **Staal**, l. c. p., 138, redescribes *Corixa nigripennis* Fab., from the W. Indies.

P. R. **Uhler**, in Dr. Packard's paper, describes *Corixa decolor*, from Clear Lake, California.

The interesting fact that the eggs of *Corixa* are used for food, by the Mexicans, is mentioned by Dr. Packard, quoted from Tylor's Anahuac, and from Virlet d' Aoust. Mr. Say, in his "Descriptions of the Heteroptera of North America," p. 39, says:—"Passing through the market in the city of Mexico, I obtained a few specimens (of *Corixa abdominalis* Say), from the quantity of at least a peck, exposed for sale by an Aztec woman."

(HOMOPTERA.)

CICADIDÆ.

C. V. **Riley**, Third Report, remarks the injuries done to apple trees by *Cicada septendecim*, and its thirteen year brood.

C. **Staal**, l. c., reports *Cicada tibicen* Linn. from South America. It ranges extensively over eastern North America, from New York southwardly.

APHIDÆ.

A. **Fitch**, l. c., describes *Aphis circezandis* from New York, and remarks the habits of various *Aphids*.

C. V. **Riley**, Third Report, assumes the identity of the North American *Phylloxera vitifoliæ* Fitch, with the European *P. vastatrix* Planchon, and gives a much detailed account of its nature and characteristics.

COCCIDÆ.

W. **LeBaron**, l. c., p. 24, seq., details the habits and appearance of *Mytilaspis conchiformis* Gmelin, from the Apple bark, and of *Mytilaspis pinifoliæ* Fitch, from the leaves of pine trees.

MEMBRACIDÆ.

C. **Staal**, l. c., redescribes *Ceresa bubalus*, Fab., p. 24, from N.

America; *Cyrtosia mutica* Fab., p. 25, N. America; *Procyrta inermis* Fab., p. 38; describes as new, *Aconophora hastata*, Mexico, *A. nigra*, *A. Mexicana*, *A. gracilicornis*, *A. pallescens*, *A. femoralis*, *A. gladiata*, p. 35, Mexico, and notices *Platycotis vittata* Fab., p. 37, Carolina; *Campylenchia curvata* Fab., p. 43, N. America; describes *Tropidoscyta pallidipennis*, *T. cornutata*, Mexico, and *T. gibbera*, p. 46, Texas; notices *Monobelus fasciatus* Fab., p. 49, W. Indies; *Orthobelus Havanensis* Fairm, Cuba; and describes *Monobelus lateralis*, from Cuba.

JASSIDÆ.

T. GLOVER, Monthly Report Depart. Agricult., notes the habits of *Erythroneura vitis* Harris, and of another species, not mentioning its name.

C. STAAL, l. c., p. 59, cites *Xerophlœa viridis* Fab., from the W. Indies; *Aulacizes irrorata* Fab., Carolina, etc.

FULGORIDÆ.

C. STAAL, l. c., redescribes *Bothriocera undata* Fab. p. 93, from West Indies; *Pintalia variegata* Fab. p. 94, W. Indies; *Chlorochara vivida* Fab. p. 107, W. Indies; *Ormenis relicta* Fab., p. 111, Carolina; *Petrusa marginata* Linn., p. 111, W. Indies, and *P. pygmæa*, Fab., p. 112, from island of St. Barthelemy.

ORTHOPTERA.

C. THOMAS (U. S. Geol. Surv. Wyoming, 1871. 265–284). A List and Description of new species of Orthoptera.

This paper is chiefly a copy of the one published in Proc. Acad. Nat. Sci., Phila., 1870. The descriptions of some new species, and somewhat copious notes on *Caloptenus spretus* are added. The additions only are noticed here.

C. THOMAS (Proc. Acad. Nat. Sci., Phila., 1871. 149–153). Contributions to Orthopterology.

C. THOMAS (Can. Ent., III, 168). On a new Grasshopper from Colorado.

H. DE SAUSSURE. Mémoires pour servir a l'Histoire naturelle du Mexique des Antilles et des États-Unis, IVme Mémoire. Mantides Américains, Tome IIme; Prém. Partie. 4to.

H. de Saussure (Mélanges Orthopterologiques 1869) describes several Central American species of Blattariæ and Mantides, with many rectifications of synonomy, referring often to American species.

F. Meinert (Naturhistoriske Tidsskrift, Copenhagen, Bd. V. 1870.) describes a new Labidura.

F. Walker. Catalogue of the Specimens of Blattariæ in the Collection of the British Museum. 8vo. pp. 239, 1870–1, with Supplement.

F. Walker. Catalogue of the Specimens of Dermaptera Saltatoria in the Collection of the British Museum. 8vo, parts 1–3, 1870.

GRYLLIDÆ.

F. Walker (Cat. Dermap. Saltatoria, 1870) describes as new *Gryllus septentrionalis*, Mex., St. Domingo, West Coast America, *G. luridus*, Vera Cruz, *G. determinatus*, West Indies, *G. parilis*, St. Vincent, Brazil, *G. similaris*, St. Domingo, *G. angustulus*, *G. contingens*, West Indies, *G. signatipes*, West Coast America, *Tafalisca* (n. gen.) *lurida*, St. Domingo, *Nemobius Mexicanus*, Oajaca, *Orocharis signatus*, Orizaba, *O. scitulus*, *O. fusiformis*, Honduras, *Encoptera insularis*, *Phyllopalpus latipennis*, Jamaica, *P. nigrovarius*, Mexico, *Lebussa* (n. gen.) *tenuicornis*, *L. similis*, St. Domingo, *Zaora cinctipes*, Jamaica, *Œcanthus nigricornis*, Illinois, *Œ. varicornis*, *Œ. formosus*, Mexico, *Laurepa* (n. gen.) *valida*, Jamaica.

LOCUSTARIÆ.

F. Walker (Cat. Dermap. Saltatoria, 1870) describes as new *Stenopelmatus politus*, Orizaba, *S. erythromelas*, *S. lycosoides*, Mexico, *S. cephalotes*, West Coast America, *Ceuthophilus zonarius*, Vancouver's Is., *Licodia* (n. gen.) *pallipes*, St. Domingo, *Neduba* (n. gen.) *carinata*, California, *Marsa* (n. gen.) *arcuata*, Saskatchewan, *Decticus sphagnorum*, Hudson's Bay, *Insara* (n. gen.) *strigulata*, Mexico, *Moucheca* (n. gen.) *pretiosa*, Honduras and Mex., *Conocephalus contingens*, Mex., *C. ascendens*, Jamaica, *C. bilineatus*, St. Domingo, *C. viridator*, Honduras, *Sagona* (n. gen.) *subpunctata*, Honduras, *Monocentrum supremum*, Mex., *M. excellens*, *M. subæquale*, *M. decoratum*, St. Domingo, *M. divisum*, Jamaica, *Orophus notatus*, Oajaca, *O. ringens*, Jamaica, *O. decisus*, Honduras, *Pseudophyllanax* (n. gen.) *insularis*, Isle of Pines, *Meroncidius subguttatus*, Jamacia, *M. circumdatus*, *M. tenebrosus*, Oajaca, *M. discoidalis*, *M. subnotatus*, Jamaica, *M. indistinctus*, Mexico or Brazil, *M. immunis*, *Gryllacris longiuscula*, Isle of Pines, *G.? parvulus*, St. Domingo, *Phylloptera subnotata*, Oajaca.

ACRIDIDÆ.

C. Thomas (U. S. Geol. Surv., Wyo., 269-281) describes a new genus *Acrolophitus*, in which he places *Gryllus hirtipes* Say; also the following new species, *Stenobothrus obionus*, *St. brunneus*, and *St. quadrimaculatus*.

C. Thomas (Proc. Acad. Nat. Sci., Phila., 1871, 149-153) describes *Caloptenus differentialis* (= *Acridium differentiale* Uhler), *Opomola* (Opomala) *brachyptera* (female), and *Mesops Wyomingensis* (sp. nov.)

C. Thomas (Can. Ent. III, 168) describes as new *Caloptenus Dodgei* from Pike's Peak, Col. Terr.

F. Walker (Cat. Dermap. Saltatoria, 1870) describes as new *Mesops? carinatus?* United States, *Xiphocera inclavata*, Orizaba, *Rhomalea picticornis*, *M. auricornis* Mexico, *Cyrtacanthus inscripta*, Jamaica, *C. pectoralis*, *C. impleta*, *C. septentrionalis*, West Coast America, *Acrydium piceifrons*, Orizaba, *A. vitticeps* Oajaca, *A. scutellare*, Mexico, *A. vicarium* Orizaba, *A. strenuum*, Oajaca, *A. varipes*, St. Domingo, *A. tibiale*, West Coast America, *A. luridescens*, Honduras.

MANTIDES.

H. de Saussure (Mél. Orth., 1869) describes as new *Gonatista Cubensis*, Cuba; *Acontista Cordilleræ*, *Stagmomantis Nahua*, Mexico; *Thespis Cubensis*, Cuba; *Oligonyx bicornis*, Mex. In the same, 1870, 239, *O. Scudderi*, N. America.

H. de Saussure (Mém. Mantides Amer.) redescribes with many notes and family and generic characters, our American species of this family. He gives descriptions of the following new species (some previously noticed in abstract in Bulletin Ent. Suisse, iii, 1869, which we have not seen) *Acontista Cordilleræ* from Mexico; *A. multicolor*, Gaudeloupe; *Stagmomantis Nahua*, Orizaba, Cordova, S. Carolina and a Mexican var.; *Phasmomantis Sumichrasti*, Cordova and Orizaba; *Amelis Mexicana*, Michoacan, Mex.; *Iris Antillarum*, St. Thomas, St. Domingo; *Oligonyx* (n. gen.) *bicornis*, Alvarado, Isthmus of Tehauntepec; *Thespis* (n. gen.) *Cubensis*, Cuba; *Pseudacanthops* (n. gen.) *cœlebs*, Mex.; *Vates pectinata*, Mexico?; *V. Tolteca*, Mex.

The following species are referred to new genera proposed by the author in this, or works published since 1868: *M. grisea* Fabr. and *M. ornata* Stoll, to *Gonatista*; *M. Carolina* Linn., *M. dimidiata* Burm., *M. Domingensis* Beauv. and *M. latipennis*, Burm., to *Stagmomantis*.

BLATTARIÆ.

H. de Saussure (Mélanges orthopterologiques, 1869) describes as new *Theganopteryx fallax*, Mexico?, *Anaplecta otomia*, Mexico.

F. Walker (Cat. Blatt., 1870) describes as new *Blabera quadrifera*, Mexico, *B. subspurcata*, St. Domingo and Brazil, *Libisoca* (n. g.) *æqualis*, St. Domingo, *Lisapona* (n. g.) *marginalis*, Honduras, *Panchlora tripartita*, Orizaba, *Proscatea? illepeda*, St. Domingo, *Zetobora sigillata*, Honduras, *Euthyrrapha mordelloides*, Orizaba, *Epilampra sabulosa*, *E. microspila*, St. Domingo, *Blatta latimargo*, Hong Kong and Honduras, *B. insularis*, *B. reticulosa*, Jamaica, *B. incisa*, St. Domingo and Mauritius? *Ischnoptera vacillans*, St. Domingo, *I. nigricollis*, Georgia, *I. terminalis*, Jamaica, *Periplaneta repanda*, Honduras, St. Domingo, Philippines, Ceram, *P. subcincta*, Oajaca, *P. inclusa*, St. Domingo and New Hebrides, *P. floridana*, N. Americana, *P. semipicta*, Florida, *Nyctibora stygia*, St. Domingo and Honduras, *Polyzosteria panesthoides*, Jamaica, *Perisphæria detersa*, Jamaica. In supplement, *Zetobora guttipennis*, South Mexico.

A. S. Packard, Jr. (Amer. Nat., iv, 1870, 620). The Caudal Styles of Insects Sense Organs, *i. e.*, abdominal Antennæ. The sense organs in the short anal stylets of *Periplaneta Americana* are briefly described and supposed to be organs of smell. Similar organs are described in the palpi of *Chrysopila*, a dipter, and also supposed to be smelling organs.

FORFICULARIÆ.

F. Meinert (Nat. Tids., v, 1870) describes on p. 279 as new *Labidura advena* from Jamaica.

NEUROPTERA.

A. S. Packard, Jr. (Amer. Naturalist, v, 91) Bristle Tails and Spring Tails. In this paper is given a general account of the Thysanura, with a description of the mouth-parts of an undescribed Lepisma. Packard thinks that the Lepismidæ and Campodeæ do not "diverge from the Neuropterous type any more than the Mallophaga, or biting lice, do from the type of Hemiptera." He considers *Campodea* as affording a passage from the winged Neuroptera to the Poduridæ. A description of the mouth-parts of *Tomocerus plumbeus* is given, with woodcuts, and also of an organ overlooked by previous observers which he is disposed to consider as in part representing the ovipositor of other insects. He regards the "Lipuridæ" as a subdivision of Poduridæ rather than a distinct family.

A. S. **Packard**, Jr. (Proceedings Bost. Soc. Nat. Hist., xiii, 405). New or rare American Neuroptera, etc.

A, S. **Packard**, Jr. (1st Ann. Rep. Injurious and Beneficial Insects, Mass.). Contains notices and figures of two Libellulid larvæ.

A. S. **Packard**, Jr. (Amer. Nat., v, 564). The Embryology of Chrysopa, and its Bearings on the Classification of the Neuroptera. In this paper the author divides the larvæ of insects into two general forms, the leptiform and eruciform. The leptiform have a flattened or oval body, with large thoracic legs, such as the larvæ of the mites and most Neuroptera, Orthoptera, Hemiptera, and many Coleoptera; while the eruciform have long cylindrical fleshy bodies, as the larvæ of the Diptera, Lepidoptera and Hymenoptera. "The larvæ of the earliest Insects were probably leptiform, and the eruciform condition is consequently an acquired one, as suggested by Fritz Müller."

A. S. **Packard**, Jr. (Memoirs of Peabody Acad. Science) Embryological Studies on Diplax, Perithemis, and the Thysanurous genus Isotoma. The embryology of Diplax and Perithemis, is said to agree with that of Calopteryx and Agrion as described by Brandt. The embryology of Isotoma agrees in all important particulars with that of other insects, and especially the Phryganeidæ as described by Zaddach. A period late in embryonic life is described when the epicranium, clypeus and labrum, and mouth parts are much as in the embryo of Mystacides. "From this time begins the process of degradation, when the insect assumes its Thysanurous characters, which consist in an approach to the form of the myriapodous head." Packard states that the "spring" is "homologous with the third pair of blades in the unjointed ovipositor of the higher insects, and seems to be homologous with the legs and cephalic appendages."

A. S. **Packard**, Jr. (Amer. Nat., V, 707) The Position of the Caddis Flies. A Review of McLachlan's views on the same subject. They are considered as a family of Neuroptera (in the Linnæan sense).

F. **Brauer** (Verh. Zool. Bot. Gesellsch. Wien). Ueber zwei neue von Prof. D. Bilimek in Mexico endeckte Insekten. He describes a new Phryganid and Agrionid.

PSOCIDÆ.

A. S. PACKARD, JR. (Proc. Bost. Soc. Nat. Hist., xiii, 405) describes as new *Amphientomum Hagenii*, from Maine and Mass.

LIBELLULIDÆ.

F. BRAUER (Verh. Zool. Bot. Gesellsch. Wien) describes as new from Mexico *Xiphocentron Bilimekii.*

A. S. PACKARD, JR. (1st Ann. Rep. Inj. and Ben. Insects, 30) describes and figures the larva of *Cordulia lateralis* Burm., identified by Dr. Hagen, and of Didymops?

HEMEROBIIDÆ.

A. S. PACKARD, JR. (Proc. Bost. Soc. N. H., xiii, 407) notices the occurrence of *Psectra dipterus* Burm., at Brunswick, Maine, not before detected in America.

A. S. PACKARD, JR. (Amer. Nat., v, 564) in a paper on the Embryology of Chrysopa, and its bearings on the classification of the Neuroptera, gives a sketch of the embryology of Chrysopa, which in its latter stages is identical with that of the Libellulidæ.

PHRYGANEIDÆ.

F. BRAUER (Verh. Zool. Bot., Gesellsch. Wien) describes as new from Mexico *Paraphlebia hyalina.*

PANORPIDÆ.

A. S. PACKARD, JR. (Proc. Bost. Soc. N. H., xiii, 408) describes as new *Boreus Californicus* from Siskiyou Co., Cal.

CAMPODEÆ.

A. S. PACKARD, JR. (Proc. Bost. Soc. N. H., xiii, 409) describes as new *Campodea Americana* from Salem, Mass., and in the American Naturalist, v. 747, C. COOKEI from Mammoth Cave.

ARACHNIDA.

BELLEROYE (Bulletin de la Société d'Histoiré naturelle du department de la Moselle, Metz, 1870), gives a description of *Mygale Mexicana* n. sp., from Mexico.

C. S. MINOT (Proc. Bost. Soc. Nat. Hist., page 20), Notice of *Mygale Hentzii* Gir., and *Pompilus formosus*, which preys on it.

A. Ausserer (Verhandlungen der Zoologisch Botanisch Gesellschaft in Wien, 1871, Vol. xxi, page 117). Beitrage zur der Territelariæ. This articles contains descriptions of the following North American species: *Atypus niger* Hentz, Massachusetts; *Antrodiætus unicolor* = *Mygale unicolor* Hentz, Alabama; *Closterochilus gracilis* = *Mygale gracilis* Hentz, *Therogretes Walckenæri*, North America; *Madognatha Abbotii* Walck, N. America; *Charizops loricatus* = *Actinops loricatus* Koch, Mexico; *Cyclosmia truncata* = *Mygale truncata* Hentz, Alabama; *Pachylomerus solstitialis* = *Mygale solstitialis* Hentz, Alabama; *Diplura macrura* Koch, West Indies; *Crypsidromus innocuus*, Havana; *Euryplema mordax* Texas; *E. Californica* Dol., California; *E. leiogaster* Dol., California; *E. spinicras*, Cuba.

E. D. Cope (Ann. Mag. Nat. Hist., 4th S., Vol. 8, p. 368) in an article on "Life in the Wyandotte Cave" mentions an *Aranea*-like and an *Opilio*-like spider as found in the cave.

John Blackwall (Ann. Mag. Nat. Hist., 4th S., Vol. 8, No. 48, Dic. 1871, pp. 429–436), Notice of spiders captured by Miss Hunter in Montreal, Upper Canada, with descriptions of species supposed to be new to Arachnologists. He describes as new *Lycosa Canadensis*, *Philodromus obscurus*, *Drassus Humteræ*, *D. diversus*, and *Ergatis diligens*. He also mentions *Drassus vasifer* Walck., *Theridion tepidariorum* C. Koch, *Epeïra servicata* C. Koch, and *E. cucurbitina* Walck.

J. H. Emerton (Amer. Nat. Vol. 5, p. 148) gives an account of "Flying Spiders," with a figure.

A. S. Packard, Jr. (Amer. Nat. Vol. 5, p. 47), gives an account of the spiders thus far found in the Mammoth Cave, with figures. They are *Anthrobia mammouthia* Tellkf., and *Acanthocheir armata* Lucas (*Phalangodes armata* Tellkf.)

ACARINA.

A. S. Packard, Jr. (Amer. Jour. Sci., 1, Feb., 107). On Insects inhabiting Salt Water. Descriptions are given of *Thalassarachna* (n. gen.) *Verrillii* (with figures) dredged in twenty fathoms at Eastport, Maine; and *Hydrachna tricolor*, New Haven, Conn.

MYRIOPODA.

A. S. PACKARD, JR. (Ann. Mag. Nat. Hist., 4th S., Vol. 7, p. 72), gives a note on a remarkable Myriopod, *Pauropus Lubbockii* nov. sp. from Salem, Mass. (Copied from Amer. Nat. Dec. 1870). See also for a fuller description Proc. Bost. Soc. Nat. Hist., xiii, 1871, 409.

In the American Naturalist (1871, iv, 736) he publishes a note on "The Ancestry of Insects" in which he suggests that the Myriopods, Arachnids and Hexapods have descended from a Leptiform insect. He does not regard the insects as having been evolved either from a zoëa or nauplius form, and refers the ancestry of both classes (the Insecta and Crustacea) independently of each other to the worms.

A. HUMBERT ET H. DE SAUSSURE (Verh. Zool. Bot. Gesellsch. Wien, xix, 1869. 669–692.) Description de divers Myriapodes du Musée de Vienne. Ser. 1. Comprenant la famille des Polydesmides.

A. HUMBERT ET H. DE SAUSSURE (Revue et Mag. de Zoologie, 1869, 149–159) Myriapoda nova Americana.

E. D. COPE (Ann. Mag. Nat. Hist., 4th S., Vol. 8, p. 368) in an article on "Life in the Wyandotte Cave," mentions a species of *Pseudotremia* as found in the cave.

A. S. PACKARD, JR. (Amer. Nat., Vol. 5, p. 748), describes and figures *Spirostrephon Copei* nov. sp. from the Mammoth Cave. The species is blind. Mention is also made of other species found in caves, and the validity of the genus *Pseudotremia* is questioned.

CHILOPODA.

HUMBERT ET SAUSSURE (Rev. et. Mag. Zool. 1869) describe as new *Lithobius Aztecus*, *L. Mystecus*, and *L. Toltecus*, *Scolopendra Olmeca*, *S. mystica*, *S. Sumichrasti*, *Scolopocryptops Mexicana*, *Newportia Azteca*, *Geophilus Aztecus* and *Arthronomalus Toltecus* from Mexico.

POLYDESMIDÆ.

HUMBERT ET SAUSSURE (Verh. Zool. Bot. Gesellsch. Wien. 1869) describe as new *Sphæriodesmus gracilis*, *Polydesmus* (Fontaria) *simil-*

limus, *P.* (F.) *Mystecus*, *P.* (F.) *Acolhuus*, *P.* (F.) *Zendalus*, *P.* (F.) *Nahuus*, Mexico, *P.* (Oxyurus) *Couloni*, Cuba, *P.* (O.) *Sumichrasti*, *P.* (O.) *Orizabœ*, *P.* (O.) *intermedius*, *P.* (*Tropisoma*) *coccineus*, *P.* (Rachidomorpha) *uncinatus*, and *P.* (Scytonòtus) *Woodianus*, *Platydesmus Mexicanus*, Mexico.

JULIDÆ.

HUMBERT ET SAUSSURE (Rev. et Mag. Zool. 1869) describe as new *Parajulus* (n. gen.) *Olmecus*, *Craspedosoma Mexicanum*, *Spirobolus Nahuus*, and *S. heteropygus*, Mexico.

SIPHONOPHORIDÆ.

HUMBERT ET SAUSSURE (Rev. et Mag. Zool. 1869) describe as new *Siphonophora Mexicana* from Mexico.

MUS.120.20.9.13

FIFTH

ANNUAL REPORT

OF

THE TRUSTEES

OF THE

PEABODY ACADEMY OF SCIENCE,

FOR THE YEAR 1872.

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ORGANIZED. A.D. 1868.

SALEM:
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1873.

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TRUSTEES AND OFFICERS OF THE ACADEMY

FOR THE YEAR 1873.

TRUSTEES.

ASA GRAY, Cambridge, Mass.
WILLIAM C. ENDICOTT, Salem, Mass.
G. PEABODY RUSSELL, Bristol, R. I.
OTHNIEL C. MARSH, New Haven, Conn.
HENRY WHEATLAND, Salem, Mass.
ABNER C. GOODELL, Jr., Salem, Mass.
JAMES R. NICHOLS, Haverhill, Mass.
S. ENDICOTT PEABODY, London.

Finance Committee.—Messrs. ENDICOTT, NICHOLS and GOODELL.

Executive Committee.—Messrs. ENDICOTT, WHEATLAND, GOODELL and NICHOLS.

OFFICERS.

President.—W. C. ENDICOTT.
Vice President.—HENRY WHEATLAND.
Secretary of the Trustees.—A. C. GOODELL, Jr.
Treasurer.—J. R. NICHOLS.
Director of the Museum.—F. W. PUTNAM.
Secretary of the Council.—A. S. PACKARD, Jr.
Curators.—F. W. PUTNAM and A. S. PACKARD, Jr.
Assistant in the Museum.—CALEB COOKE.
Director's Clerk.—W. S. WEST.
Treasurer's Clerk.—B. W. RUSSELL.

COUNCIL.

The Council consists of the PRESIDENT, VICE PRESIDENT, SECRETARY OF THE TRUSTEES, TREASURER, DIRECTOR and the CURATORS.

FIFTH ANNUAL REPORT

OF THE

PEABODY ACADEMY OF SCIENCE.

FOR THE YEAR 1872.

SATURDAY, FEBRUARY 8, 1873.

MEETING of the Trustees duly held, according to notice, at 12 M. Present, Messrs. Gray, Endicott, Wheatland, Goodell and Nichols.

The record of the last annual meeting was read; also the Treasurer's report and the letter accompanying the report of the Council.

Voted, That the following appropriations be made for the ensuing year; namely, one thousand dollars towards the extinguishment of the debt; one thousand dollars, to be paid under the agreement with the Editors of the "Naturalist;" five thousand five hundred dollars, for the total expenses of the Museum for this year; and the balance to defray the expenses of the Trustees in the management of the Fund for the same period.

It was then

Voted, That article xii of the by-laws be amended by striking out the word "five," and inserting the word "four," instead thereof, as the number that shall constitute a quorum.

It was also

Voted, That article viii of the by-laws be amended by striking out the words "April" and "October."

It was then

Voted, That the consideration of the first and second recommendations in the letter of the Secretary of the Council, be postponed to the July meeting; and that, in pursuance of the third recommendation, the Council have authority to print their report and the papers therein referred to; the same to be charged to the Trustees' Expense account.

After appropriate remarks, the following resolutions, reported by Dr. Gray were then adopted :—

Resolved, That the Trustees of the Peabody Academy of Science being, at their adjourned annual meeting, officially notified of the sudden decease of their distinguished associate, Dr. HENRY C. PERKINS, one of the original members of this Board, would hereby record the expression of their profound sorrow at the great loss which they have sustained in this dispensation of Divine Providence, which has removed from their councils a cherished companion and personal friend, as well as a wise and experienced administrator of this important trust, for which he was especially qualified by his professional and scientific attainments, and by his wholly admirable traits of character.

Resolved, That a copy of this vote be communicated to the family of our deceased associate, with the expression of the sincere sympathy of the members of this Board, in their great bereavement.

The following named gentlemen were elected officers of the Board for the ensuing year.

President.—WILLIAM C. ENDICOTT.

Vice President.—HENRY WHEATLAND.

Secretary.—ABNER C. GOODELL, JR.

Treasurer.—JAMES R. NICHOLS.

Finance Committee.—Messrs. Endicott, Nichols and Goodell.

Executive Committee.—Messrs. Endicott, Wheatland, Gray and Goodell.

Adjourned.

A. C. GOODELL, JR.
Secretary.

REPORT OF THE FINANCE COMMITTEE FOR 1872.

THE Finance Committee submit the following Report for the year ending January 15, 1873.

The Permanent Fund remains at the sum of $100,000, as by the report of last year. We have reduced the debt of the Academy one thousand dollars during the past year, so that there is now outstanding the sum of $4,400. A considerable reduction will probably be made during the ensuing year.

The following account exhibits the receipts and expenditures from Jan. 15, 1872, to date of this report.

Cash on hand Jan. 15, 1872,		$ 156 87
Income from Jan. 15, 1872 to Jan., 1873,		9682 45
		$9839 32
Expenses of the Museum, including all salaries and other charges to date,	$ 5400 68	
Repairs on Marine Building,	30 87	
" " King "	103 98	
Repairs on Hubon House,	330 90	
Paid on account of Debt,	1000 00	
Watchman,	297 37	
Advertising,	9 00	
Salem Gas Co.,	9 72	
Interest,	484 42	
Treasurer's Clerk,	300 00	
Insurance,	299 50	
Water Tax,	6 00	
State, County and City Tax,	447 89	
Printing Reports, Memoirs, etc.,	745 42	
Incidental Expenses,	10 00	
Cash on hand,	303 57	
		$ 9839 32

WM. C. ENDICOTT,
for the Finance Committee.

Salem, Jan. 15, 1873.

REPORT OF THE COUNCIL FOR 1872.

To the Trustees of the Peabody Academy of Science.

Gentlemen: I have the honor herewith to transmit the Report of the Director with the accompanying documents which were accepted by the Council, at its annual meeting held this day, and ordered to be sent to the Trustees of the Academy as the Annual Report of the Council.

I have also to inform you of the following votes passed by the Council and ordered to be sent to the Trustees for their consideration.

First: That the Trustees be asked to take into immediate consideration the request made in the Report of the Director of the Museum for additional cases.

Second: That they be requested to authorize the publication of the Memoir on the "Contents of Ancient Indian Graves in Essex County" by F. W. Putnam.

Third: That the Council have authority to print the Record of Entomology for 1872, the two papers by the Curator of Articulata and such other papers mentioned by the Director in his Report as may be deemed proper by the Council, as an Appendix to the Annual Report of the Director.

A. S. Packard, Jr.,
Secretary of the Council P. A. S.

Peabody Academy of Science, Dec. 28, 1872.

REPORT OF THE DIRECTOR FOR THE YEAR 1872.

TO THE COUNCIL OF THE PEABODY ACADEMY OF SCIENCE.

GENTLEMEN :—I have the honor of briefly calling your attention to what has been done during another year in carrying on the important work which has been delegated to us, as the Council of the Academy, to perform under the general direction of the Trustees.

As the report of Dr. Packard, which is herewith submitted, will inform you of the details relating to such departments of the Museum as come under his special charge, I shall simply call your attention to the continued safe condition of the collections under his control and the faithfulness with which he has labored for their safe keeping and final arrangement.

The other departments of the Museum have continued to be under the special charge of Mr. Cooke and myself and all the time possible has been given to their care and further arrangement. A large number of specimens have been added to the cases during the year, and there is not a single department that has not been enriched to a greater or less extent.

The employment of a young lady to assist in the business management of the Naturalists' Agency has enabled Mr. Cooke to devote the whole of his time of late to the more legitimate part of his work, and the effect on our cases is already very perceptible. Especially is this apparent in the archæological department to which nearly five thousand specimens have been added during the past year.

The large number of ethnological and archæological specimens that came into our charge from the Museums of the East India Marine Society and the Essex Institute at once marked our Museum as an important one in the country in those departments, and rendered it necessary for us to keep up with the wave of archæological investigation that for a few years past has been sweeping on, over the old world and the new. For this purpose every effort possible has been made to investigate our local archæology as well as that of more distant places, and in this we have been most liberally assisted by many friends, among whom I must specially mention Alfred Osgood, Esq. of Newburyport, Mr. J. H. Sears of Beverly, and Mr. John Gould of Ipswich, who have made very important collections of local specimens which now, by their kindness, enrich our Museum and go far to illustrate our county collection of the remains of an early race that once made this region their home.

It is, however, to Dr. Charles C. Abbott of Trenton, N. J., that we are under lasting gratitude for the great liberality of presenting to our Museum probably the finest collection ever made in this country of the relics of the stone age people of a single locality. The Abbott collection, which now numbers nearly three thousand specimens of stone implements, and is rapidly increasing by the active work of the indefatigable collector and student who has made us the recipient of his treasures, is of the greatest importance for study and comparison with other specimens, as it contains so many varieties of implements of almost every known type, all collected in one of the very richest localities of which we have record. This you will realize when I state that this large collection was made in the immediate vicinity of Trenton, on the banks of the Delaware and adjoining fields and hills. A most important addition to this collection has been made within the present month, and consists of two hundred and seven stone implements of various kinds found in one little spot which Dr. Abbott describes in the Naturalist under the title of a "Homestead of the Stone Age." To say nothing of the present pecuniary expense to which Dr. Abbott has been in bringing this collection together, the value of the collection will soon be greatly enhanced by the fact that it forms the basis of his work, about going to press, on the "Stone Age in New Jersey," which will not only contain descriptions of these specimens but will be illustrated by nearly three hundred engravings taken from them, thus making the collection one that will soon be known wherever the early history of man is studied.

During the time I was absent in the West, in August and September last, every opportunity was taken to secure specimens and make examinations of the remains of the Mound Builders of the Mississippi Valley, and Mr. Cooke and myself not only made personal examination of a number of mounds from which we obtained several very interesting crania and a few stone implements, but, by the kindness of many friends in Dubuque and Chicago, we obtained a number of implements, casts of jars, and other specimens that had been taken from mounds and graves by other explorers, so that our trip was very productive and furnished much of interest for further study.

While mentioning this Western trip, I will allude to the very large collection of fishes and some other animals that we made from the Huron, Mississippi, Des Moines and Big Sioux rivers, which will prove of special interest for the purpose of studying the geographical distribution of the fishes, as the collections were made within hardly a variation of one degree of latitude, though covering nearly thirteen degrees of longitude between the most eastern and most western points.

I again have great pleasure in calling your attention to the many courtesies and the great assistance which we everywhere received during our trip, and it was most gratifying to find that, go where we would, we always found friends who were interested in our work here at the East, and were ready to assist us in every way in their power in obtaining the specimens we were after. Most particularly must I express my thanks to our numerous friends in Dubuque, Fort Dodge, Humboldt and Sioux City in the beautiful state of Iowa, for transfer across whose prairies we were indebted to the liberality of the officers of the Illinois Central Railroad Company.

A very important collection of implements of stone and bone, illustrative of the habits of the prehistoric people of the Swiss Lakes and of Denmark, has very recently been received from the Peabody Museum of Ethnology and Archæology at Cambridge, and it will give you pleasure to be informed that, by vote of the Trustees of that institution, Professor Wyman has been authorized to transmit to our Museum such duplicate specimens as he may select from those under his charge. The collection now received has been carefully selected by Professor Wyman, though it must necessarily have taken much of his valuable time which can so poorly be spared for such work.

We have also to acknowledge a few casts of ancient Mexican sculptures recently received from the Smithsonian Institution and, as our Museum had hardly a specimen illustrating the Mexican carvings or the implements of the stone age and lake habitations of Europe, the specimens received from both these institutions are of special interest and value.

It is also gratifying to recall the several specimens in various departments that have been brought to the Museum by our seafaring friends, and though the present state of our foreign commerce has greatly reduced our receipts from this direction, which were so numerous in former years, yet we are assured that the spirit to collect for us still exists, and, as soon as opportunities again offer, we shall receive important additions from foreign localities. To Mr. J. W. Luscomb of this city we are particularly indebted for his annual instalment of fishes and other specimens from distant parts.

The European trip taken by Dr. Packard early in the year was productive of much good to the Academy, as through his efforts we have been brought more intimately into connection with scientists abroad, which has led to the exchange of specimens, securing for our Museum many named species of genera not before represented in our collection. This will ultimately be of still greater benefit as we become able to extend the system and thereby secure specimens illustrative of special groups which are required for the purposes of comparison.

The short but quite successful dredging trip to the St. George's Banks by Dr. Packard and Mr. Cooke, under the direction of the United States Fish Commission, in the United States Coast Survey Steamer Bache, will also be the means of securing for our Museum a series of the animals dredged on the various expeditions undertaken by the direction of Professor Baird as United States Commissioner of Fisheries, and will furnish us with much interesting material.

One hundred and twenty persons and institutions have presented a large number of specimens comprised in about one hundred and sixty distinct donations during the past year. An account of these donations will be found in the annexed report by Mr. Cooke.

During the year the Museum has been opened on all the holidays, and regularly on five days of each week, during which time upwards of thirty-seven thousand persons have visited the Museum, making a total of one hundred and fifty-two thousand seven hundred and twenty-two, since it was opened in May, 1869, and those who thought that there was no necessity for the special constable who is, thanks to the City Government, now regularly provided by an ordinance of the city, must from these figures be satisfied as to the importance of the act. For without such a constable constantly in the Museum during the public days, it would have been impossible for us to have admitted one-tenth the number of persons, and the thousands of citizens and strangers who now receive the benefits of a free museum would have been deprived of them, had it not been for the laudable desire of the City Government to promote the culture of the citizens by allowing them the privilege of access to the Museum.

A very important step has been made during the present winter in making the Academy of more direct benefit to education in the State than has been heretofore undertaken, and I have had the pleasure of giving to about thirty scholars, comprising the senior and advance classes of the State Normal School, a half dozen practical lessons in zoology. These lessons have not been simple lectures illustrated by diagrams and specimens but have been conducted on the only principle by which it is possible to teach the natural sciences properly, and the young ladies have each been provided with scalpel, forceps and a specimen, and taught to examine and dissect for themselves. In this way they have been led from an examination of the external characters of a single species of fish to a dissection of its muscles, and then dissecting the brain they have been led to follow out the nervous system; after that, the heart and gills and respiratory system were studied, and so on, each lesson being devoted to some special part of the animal structure, while an occasional question was asked in order to call attention to the characters that were most important to be remembered as relating particularly to the class of animals they were studying, and the scholars were urged to ask for explanation of anything they did not fully understand. In this way I believe that, though this preliminary course was confined to such instruction as could be readily given by specimens of the common sculpin and common cod, the thirty young ladies who have attended the lessons have secured a far better idea of the structure of a vertebrate animal than if they had passed ten times the number of hours in listening to lectures or in reciting lessons from a text book, important as both are as auxiliary to a more perfect knowledge of the subject.

In connection with practical education, it has been thought, by members of the Council, that something might be done in diffusing the benefits of the Academy more widely through the county, by holding ourselves in readiness to furnish such duplicate specimens as could be spared from our Museum to such public institutions in the county as are willing to provide proper accommodations for them and are desirous of forming local museums. As this would certainly be legitimate to our trust, the officers of the Museum will endeavor to supply such collections, whenever they may be called for, if they are satisfied that proper care will be given to them by the applicants.

During the past year the third Memoir of the Academy, comprising a paper by Dr. Packard on the Embryology of Hexapodous Insects, has been published as provided for at the last annual meeting. Another short memoir is now offered for your consideration and I trust will prove acceptable as the fourth of the series.

The last annual report contained several important papers which have done much to maintain the reputation of the Academy as an active institution for the advancement of science, and though several papers are in course of preparation which will be offered for publication in the fifth report, if finished in time, I have now only to ask your attention to those of Dr. Packard on the "North American Phalænidæ in the British Museum" and on the "Thysanura of Essex County with notes on other American species," and to request authority to print them in connection with this report, with such other papers as may be prepared in time. I also ask for authority to print the Record of Entomology for 1872, in the fifth report in a manner similar to that of 1871, printed in the fourth report.

During the year we have received a large number of volumes comprising the Transactions, Memoirs, Journals and Proceedings of most of the principal scientific societies and institutions at home and abroad. These important publications have been forwarded to the Academy through the Smithsonian Agency in regular exchange for our own publications, and have been acknowledged in the Naturalist under the monthly lists of books received, as well as by letter when sending our own publications in exchange. The care with which the Smithsonian Institution attends to the important duties it has assumed, in receiving and forwarding the many packages to and from the various scientific institutions and individuals, deserves the special thanks of every institution in the country, as it provides such ready and inexpensive means for the interchange of scientific works which otherwise could be brought about only by great labor and expense.

Our library has also received several gifts of books from various parties, and many volumes have been sent as editorial copies to the Naturalist.

The Naturalist has continued to be supported by the scientists of the country and is annually adding to the reputation of the Academy. Though we cannot measure its value by the popular support it receives, still it is gratifying to see that it is yearly gaining in popular favor, and that while it is constantly adding to its list of supporters in various ways, the back volumes are also regarded as important works of reference, as is evinced by the orders which are constantly being received for them.

Mr. West has continued to take the charge of the business of the Naturalist and Naturalists' Agency, but the labor in these business operations has so largely increased during the year that it has been found necessary to employ an assistant in the Agency Room, in order to prevent those of us whose work is more important in the Museum from being called from our legitimate duties to assist in a business that does not come strictly under the operations of the Academy, but the advantages of which are so great, especially in aiding the publication of the Naturalist, that it is of the first importance to have it continued, and I believe that the arrangements now made will prove most beneficial in many ways.

In closing this report I have to request your early consideration of the importance of supplying more case room for the accommodation of the entomological and archæological collections, as both departments are now entirely without sufficient cases for their arrangement, while the very numerous additions that are constantly being made to the collection of stone implements makes it necessary to provide at once for the proper arrangement of the specimens. I would therefore propose that authority be asked of the Trustees to construct a narrow case which shall extend round the gallery just above the present railing case. This can be done at an expense of not over five or six hundred dollars and without marring the general effect of the hall, and would give about three hundred running feet of cases corresponding to those now on the railing.

Respectfully submitted,

F. W. Putnam,

Director of the Museum.

Peabody Academy of Science,
Salem, December 28, 1872.

REPORT OF THE CURATOR OF ARTICULATES.

THE work done during the past year has been almost entirely confined to the Insects. The Californian Phalænidæ, the European moths of this family, and the Bombycidæ have been arranged in drawers. The Californian and Labrador Coleoptera have been sent to Dr. G. H. Horn, of Philadelphia, and returned authentically named, and much gratitude is due to that naturalist for his kindness in making these identifications. During the past autumn a collection of Californian moths received from Mr. Henry Edwards, of San Francisco, has been named and described, as nearly all were new to science, and many of the species kindly given to the Academy, thus adding very materially to the value of our collection of moths. Over one hundred species of moths of this family and the closely allied one of Pyralids, were taken by the curator and compared with the types of Mr. Walker in the British Museum, and of M. Guenée in France, being thus authentically named, and considerably enhancing the value of our collection. Some results of these comparisons are given in this annual report.

A number of dissections of the larvæ of insects have been made which will form part of a series to be placed on exhibition, illustrating the internal anatomy of the Articulates. A typical collection of Hemiptera has also been placed in the gallery completing the general typical collection of insects.

Many valuable specimens were obtained in Europe by the curator while abroad. The most valuable of these is a series of specimens of the greatest interest, illustrating the metamorphoses of the Trilobites, viz: *Sao hirsutus*, *Trinucleus ornatus*, and *Arethusina Konincki*, presented by the distinguished palæontologist, M. J. Barrande of Prague. Next in value is a series of larvæ (and in some cases the pupæ) of the

Neuropterous genera Panorpa, Mantispa, Rhaphidia, Ascalapus, Bittacus and Osmylus, with specimens of *Japyx solifugus* from Dr. Brauer of Vienna, of *Campodea fragilis* from Mr. Meinert, of Copenhagen, and of blind Coleoptera from the caves of Austria from Herr Rogenhofer; a blind spider from M. Simon of Paris, together with some rare Neuroptera, filling gaps in our collection from Mr. MacLachlan; also a collection of Braconid Ichneumonidæ from Mr. Drewson, of Copenhagen.

Specimens of the injuries done to fruit and forest trees have been collected during the autumn, and some were collected in Europe, with numerous other insects, for comparison with our own species. Large numbers of European Thysanura have been collected by the curator at various localities in northern and southern Europe to compare with our species, an account of which accompanies this report. Series of named European species of this neglected group have been promised by specialists abroad, and the Academy has received hundreds of specimens beautifully preserved, from Texas, collected by Mr. Belfrage, representing numerous forms new to science, which are described in this annual report. The species of hairy spiders belonging to the Mygale group have been placed in the hands of Mr. J. H. Emerton for identification.

The most extensive and valuable donation of insects the Academy has received during the past year is that of fifty-six species of the family of moths known as Tineidæ, of which the clothes moth is a type. These are mostly types of new species described by Mr. V. T. Chambers, of Covington, Ky., many of them are rare and difficult to collect, and so important is this collection that the annexed list of all the species is given. The more our entomologists can scatter in public museums authentic types of the species described by them, the less danger will there be of their suffering the fate of the type specimens of Say, Hentz and others which are gone, and the surer stand the records of their own work. In former years Mr. A. R. Grote, so well known for his memoirs on Lepidoptera, has also kindly deposited in the Museum types of numerous species described by him.

The collection of Crustacea and worms will be largely increased by the highly favorable results of a brief dredging trip made by the Curator and Mr. Cooke during October, in the United States Coast Survey Steamer Bache, to St. George's Banks, under the auspices of the United States Fish Commission in charge of Professor S. F. Baird. The specimens collected, while belonging to the United States, are, when duplicated, to be sent to the Academy through Prof. A. E. Verrill, who has charge of working up the invertebrates thus collected. In this way the Academy will receive suites of specimens of marine invertebrates comprising types of species described by Prof. Verrill, Mr. S. I. Smith and others, which will be of great value in working up the marine invertebrates of Essex County and adjoining region in future years.

The Curator has received from Professor Baird all the parasitic worms, largely collected by Dr. Palmer under the auspices of the Fish Commission, to be worked up and reported on ultimately. Numerous specimens of marine invertebrates from Florida, North Carolina and Massachusetts, have been sent to the Museums of the Munich Academy of Science and of the University at Leipzig, for which it is hoped that series of European parasitic worms will be sent in return.

A. S. Packard, Jr.,
Curator.

Peabody Academy of Science,
Salem, December 28, 1872.

LIST OF SPECIES OF TINEIDÆ

PRESENTED TO THE PEABODY ACADEMY OF SCIENCE, BY V. T. CHAMBERS, ESQ.

No. 1. Gracillaria salicifoliella Chamb.
2. “ plantaginisella Chamb.
3. “ blandella Clemens.
4. Ornix prunivorella Chamb.
5. “ inusitatumella Chamb.
6. Bedellia somnulentella.
7. Lithocolletis ulmella Chamb.
8. “ tritæniaella Chamb.
9. “ tilliæella Chamb.
10. “ Clemensella Chamb.
11. “ hamadryadella Clem.
12. “ robiniella Clem.
13. “ basistrigella Clem.
14. “ coryliella Chamb.
15. “ lucitiella Clem.
16. “ helianthivorella Ch.
17. “ cratægella Clem.
18. “ ornatella Chamb.
19. “ Cincinnatiella Ch.
20. “ ambrosiæella Ch.
21. “ caryæfoliella Clem.
22. “ guttifinitella Clem.
23. “ celtisella Chamb.
24. “ argentinotella Clem.
25. Tischeria badiiella Chamb.
26. “ tinctoriella Chamb.
27. “ malifoliella Clem.
28. Bucculatrix luteælla Chamb.
29. Aspadisca splendoriferella Clem. (= Lyonetia saccatella ? Pack.)
30. Bucculatrix pomifoliella Clem.
31. Chalciope undulatella Chamb.
32. Cemiostoma albella (= C. susinella ?) Chamb.
33. Gelechia physaliella Chamb.
34. “ variiella Chamb.
35. “ roseosuffusella Clem.
36. “ palpiannulella Chamb.
37. Strobisia aphroditiella Chamb.
38. Sinoe ambrosiæella Chamb.
39. Elachista præmaturella Clem.
40. Tenea crocicapitella Clem.
41. “ auripulvella Chamb.
42. Cyllene minutissimella Chamb.
43. Nepticula Clemensella Chamb.
44. “ maximella Chamb.
45. “ platanella Clem.
46. Antispila cornifoliella ? Clem.
47. Dasycera Newmanella Clem.
48. Depressaria ? (Gelechia) cercerisella Chamb.
49. Gelechia curvistrigella Clem.
50. Yponomeuta longimaculella Ch.
51. Depressaria ? pseudacaciæella Ch.
52. “ ? (Gelechia) bimaculella Chamb.
53. Cyrrha platanella Chamb.
54. Yponomeuta orbimaculella (=Y. evonymella of Europe ?)
55. Depressaria ? obscurusella Cham.
56. Callima argenticinctella Clem.

LIST OF ADDITIONS TO THE MUSEUM DURING THE YEAR 1872.

ABBOTT, Dr. C. C., Trenton, N. J. A large collection (over 2,000) of Stone Implements and Pottery from the vicinity of Trenton, containing the type specimens of "The Stone Age in New Jersey." Stone Implements from Europe. Mounted specimen of Milvulus forficulatus Sw., killed at Crosswick's Meadows, 5 miles south of Trenton. Also Reptiles, Fishes and Crustaceans from that vicinity.

ALLEN, J. F., Salem. Eriosoma on Alder from Conway, N. H.

ANDERSON, Miss **CADDIE**, Galena, Ill. Lead Ore from Galena.

BARRANDE, J., Prague, Austria. A series of specimens illustrating the earliest known stages of Sao hirsuta, Trinucleus ornatus and Arethusina Konincki from Bohemia.

BARRETT, Dr. **MOSES**, Milwaukee, Wis. Collection of Fishes from Milwaukee.

BELFRAGE, G. W., Waco, Texas. Specimens of Apus and Estherea Belfragei, Pack., many Thysanura, Ixodes from Texas.

BENDIRE, Lt. **CHARLES**, Tucson, A. T. A collection of Insects from camp near Tucson, Arizona Territory, also Lizards from that vicinity.

BERRY, **RICHARD**. Anomis xaylina pupa, Cotton ball and Phakellura niticalis from Newberne, N. C.

BURNETT, Dr. F. M. Machilis variabilis and Poduridæ from Knoxville, Tenn.

BUTLER, **NELSON**, Hamilton, Mass. Hen Hawk from Hamilton.

BUTTRICK, S. B., Salem. Specimen of Leather from the Boston fire of Nov. 9.

CAREY, **GEORGE**, Salem. Weasel and Young Blue Heron from Salem.

CARUANA, **FRANCIS**, J., Grass Valley, Cal. Aphis on Willow from Grass Valley.

CHAMBERS, V. T., Covington, Ky. Fifty-six named species of Tineidæ from Covington, types of his species, described mostly in the Canadian Entomologist. Also insect larvæ from Covington.

CLARKE, Miss E. O., Chicago, Ill. Epeira diadema from West Beach, Mass.

COLE, Mrs. **THOMAS**, Salem. A large collection of Shells and Minerals from various localities.

COOKE, C., Salem. Eggs of Acrydian freshly laid in rotten wood, Solenobia larvæ from a stone wall from Salem, and specimens of Estheria sp. from a slough near the track of the C. D. & M. Railroad at Dubuque, Iowa.

CURTIS, Dr. J., Knoxville, Tenn. Eggs of Cicada from Knoxville.

DAVIS, **EDWARD**, Dubuque, Iowa. Shell Beads from a mound near St. Louis, Mo.

DEVEREUX, Gen. **GEO.** H., Salem. Specimen of Loligo from Manchester beach.

DODGE, B., Salem. Cicada rimosa from Salem.

EMERTON, J. H., Salem. Cicada larvæ, Doryphora 10-lineata from Indiana.

EVANS, A. A. Salem. Living specimen of Brown Bat from Salem.

FERGUSON, **EDWARD**, Union Village, N. H. Fish Hawk from that vicinity.

FLINT, W. F. Insects from Richmond, N. H.

FOWLER, S. P., Danvers. Specimen of Hylodes Pickeryngii, LeC., from Danvers.

GARMON, S. W., Cambridge. Six Stone Arrowheads and one Stone Knife from near Peoria, Council Bluffs and Wyoming Terr.; also Artemia fertilis from Salt Lake.

Getchell, W. H., Salem. Stone Arrowhead found in Ipswich.

Girard, C. B. Epeira spinea from N. Y.

Goldthwait, Mrs. Wm., Salem. Eggs of Chrysopa perla from Salem.

Goodell, A. C., Jr., Salem. Limenistis disippus and Vanessa sp., from Salem.

Gould, John, Ipswich. Stone Implements from Ipswich.

Hale, Henry, Salem. Erebus odora and Pyrameis sp., from Salem.

Hale, Z. O., Beverly. Green Heron, male, from Beverly.

Hammond, Capt. Joseph, Salem. Two Japanese Coins.

Haskell, J. P., Marblehead, Mass. Borings made by Monohamus confusor in pine wood.

Hawes, Mrs. G. F., Beverly. A piece of Birch wood taken from Goose Pond in Swanville, Waldo Co., Me., after being in the water 65 years; also Rocks from Blue Hill, Hancock Co., Maine.

Henderson, J. G., Winchester, Ill. Skin of an Albino Squirrel from that vicinity.

Holt, Stillman, Salem. Æschna grandis from Salem.

Harford, W. G. W., San Francisco, Cal. Collection of Lepidoptera, Hymenoptera, Crustacea and Radiates, from San Miguel Island and San Francisco, Cal.

Holleman, Junius, Fort Bidwell, Cal. Collection of dried and alcoholic Insects, also a Frog from Goose Lake, Siskiyou Co., California.

Ireland, W. A., Salem. Tremex Columba from Salem.

Jones, C. W., Salem. Rhyssa persuasoria and two spiders from Salem.

Jones, George, Salem. Phalerope from ?

Kimball, James, Salem. Pupa of a Moth. Fruit of the Japan Quince and of the Pomegranate and flowers of the Banana from Florida.

Kimball, Capt. Thomas, Salem. Chrysalis of Vanessa antiopa from Salem.

Knights, Stephen, Salem. Pyrameis Huntera from Salem.

Larrabee, E., Beverly. Mica found at Beverly.

Leuckart, Prof., Leipzig. Pentastomum tænoides ♂♀ and young from Germany.

Lewis, J., Salem. Cicada rimosa from Salem.

Luscomb, J. W., Salem. Specimen of J. Ibex from Beloochistan.

Magill, Frank, Salem. Golden Eye Duck, male, from Salem.

Manning, Robert, Salem. Nest of Megachile, Leaf Cutter Bee, in the trunk of a Pear Tree from Salem.

McNiel, J. A., Binghampton, N. Y. A large collection of Radiates, Mollusks, Crustaceans, etc., from the Gulf of Panama, also a specimen of Meandrina from Aspinwall.

Meinert, Fr. Museum of Copenhagen. Six specimens Miastor and three specimens Campodea fragilis Meinert from Copenhagen.

Mowe, George. Cuterebra larva from under the skin of Lepus Americanus from Lowell, Mass.

Murphy, Clarence E., Salem. Great Blue Heron killed in Salem.

Museum at Bergen, Norway. Lophohelia prolifera from Norway.

Museum Comparative Zoology, Cambridge. Brittacus aptera ♂♀, California.

Museum, Imperial, Vienna, Austria. Simuliam maculatum from Austria.

Museum of the Royal University of Christiania, Norway (through Prof. Esmark). Pterogorgia arborea and Primnoa lepadifera, Norway; also Amphioxus lanceolatus from Christiansand, Norway.

Neal, Miss Caroline, Salem. Shrew mole from Salem.

Nelson, George, Georgetown, Mass. Snow Bunting from Georgetown.

Nelson, J., Newburyport. Epeira spinea from Newburyport.

NEWCOMB, D. B. and J., Salem. Eye of Sword Fish.

OBER, F. A., Beverly. Red Tailed Hawk from Beverly. Eggs of Brown Pelican, Little Blue Heron, Snowy Heron, Louisiana Heron and Least Tern from Florida.

OSGOOD, ALFRED, Newburyport, Mass. Collection of Stone Arrowheads and other implements from Newburyport.

PACKARD, Dr. A. S., **JR.**, Salem. Collection of Hymenoptera and specimens illustrating economic entomology from Brunswick, Me. Coleopterous larva allied to Elmis; Mite attacking the Aphis of the Rose from Salem. Land shells from Heidelberg, Germany, the Baths of Caracalla, Rome, and Civita Vecchia, Italy. Scratched pebbles, moraine mud and sand from Chamounix. Glacial Moraine sand from Pass of Llanberis, North Wales. Quaternary Fossil Scalaria from Sweden. Frog from edge of the Rhone Glacier, Switzerland. Nest of Chalecodoma murina, nests of Psyche helix and cells of Polistes from Vienna, Austria. Collection of about twenty species of Thysanura from England, Germany, Italy and Norway. Collection of all orders of Insects from England, Germany, Italy and Scandinavia.

PAGENSSTECHER, Prof., Museum of the University of Heidelberg. Diphya acuminata from Mentone, France.

PEABODY, A. S., Cape Town, Africa. Fishes and dried flowers from the vicinity of the Cape of Good Hope.

PEABODY, FLINT, Danvers. Stone Gouge found in Danvers on land of Mrs. Mary Page.

PEABODY MUSEUM OF AMERICAN ARCHAEOLOGY AND ETHNOLOGY. A fine collection of Stone Implements from the Island of Fyen, Denmark, Persigny le Grand and Julland; also Implements of Stone and of Deer Antlers from the Neuchatel Lake dwellings.

PERKINS, G. P., Salem. Clytus nobilis and other insects from Salem.

PERKINS, G. W., Salem. Sphinx from Salem.

PROCTOR BROTHERS, Gloucester, Mass. Lithodes Arctica from Gloucester.

PUTNAM, F. W. and **COOKE**, C., Salem. Skulls and portions of Skeletons, two Arrowheads and pieces of Pottery from mound at Eagle Point, Dubuque, Iowa. Fishes and Crustacea from the Mississippi river at Dubuque. Reptiles and Insects, from Dubuque and vicinity. Fishes, Crustacea and Insects from Soldier Creek, at Fort Dodge and from the Desmoine river at Fort Dodge. Insects and Minerals from Ft. Dodge. Fishes, Crustaceans and Insects from the Missouri river and the Big Sioux at Sioux City and from the vicinity of Sioux City generally. A large collection of Reptiles, Fishes, Crustaceans and Insects from the West Fork of the Desmoine river at Springvale (now Humboldt) and from that vicinity generally, also Minerals from that locality. A collection of Insects from various points of the route from Dubuque to Sioux City. A large collection of Fishes, Crustacea, etc., from the Huron River at Ann Arbor, Mich.

PUTNAM, Mrs. E., Salem. A curiously shaped stone found in a load of gravel. It may have been dressed into this shape by the Indians.

REED, Miss F. Insects from Southboro, Mass.

ROGENHOFER, ALEX., Imperial Museum, Vienna. Adelops Milleri from Caves of Carniolia, Europe, and Pryetus Schmidtii from Crania, Austria.

RINGUEBERG, E. N. S., Lockport, N. Y. Feathers from an Albino Robin from Lockport.

RUSSELL, BENJ., Danversport. Two young pigs, malformed.

SANBORN, C. I., Salem. Epeira sp. from Salem.

SCUDDER, S. H. Nest of Polistes from Cairo, Egypt. Pulex, Coleoptera from Egypt, two Xylocopa, two Bird flies (Ornithomyia?), Musca and Mites parasitic on it, Hymenopterous larva parasitic on Pimelia, from Egypt. Photograph of Human Skeleton found in a cave near Mentone.

SEAMAN, WM. H., Howard University, Washington, D. C. Incrustations from the northern face of the Washington monument at Washington, D. C.

SEARS, JOHN H., Beverly. Bones, Pottery and Stone implements, from shell heaps and graves and from the surface of fields, from various places in Essex Co.

SHEPARD, WM. U., Marblehead, Mass. A Terra Cotta lamp? from Pompeii, brought home by Capt. Michael Powers, about thirty years ago.

SIBLEY, S. U., Salem. Platessa sp., colored on both sides, from Salem Harbor.

SIMON, E., Paris, France. Scotolemon terricola (blind) from the caves of Corsica.

SILSBEE, MRS. B. H., Salem. Danaus archippus and Diapheromea femoratum, from Salem.

SLAUGHTER, J. W., Owensboro, Ky. Pomotis, showing the effects of absence of light on the eyes, taken from a cistern at that place.

SLOAN, Dr. JOHN, New Albany, Ind. A collection of Etheostomoids, a few other Fishes and several Aquatic Insects, from New Albany.

SMITHSONIAN INSTITUTION. Three Casts of Stone Figures from Mexico.

STODDER, SIMON. Specimens of Asbestos from New Jersey.

STONE, JOSEPH WHITE, ——. Stone sinker from ——.

SUHM, Dr. W. VON, Munich. Monostoma mutabile from Germany.

SYMONDS, F. P., Salem. Sphinx from Salem.

THOMPSON, ROSWELL P., Exeter, N. H. Hen Hawk from Hamilton.

TIBBETS, A. T., Salem. Common Brown Bat from Salem.

TILTON, S. D., Salem. Sphinx 5-maculata on tomato.

VICKARY, N., Lynn. Pupa of a dragon fly from Lynn.

WARD, Dr. JOHN W., State Lunatic Asylum, Trenton N. J. Dynastes Tityus from Trenton.

WEBB, BENJ., Jr. Radiates from Zanzibar, Africa.

WEST, W. S., Salem. Spiders from Salem.

WHITE, G. M., Salem. Insects from Salem.

WHITTREDGE, JOHN, Hamilton. Stone implements from Hamilton.

WOOD, Dr. WM., East Windsor Hill, Conn. Lota compressa from Connecticut River.

YARROW, Dr. H. P., Ft. Macon, N. C. Ligia and Termes from Ft. Macon.

BY EXCHANGE. Four casts of Vases from the mounds of Missouri. A skeleton of a Horse.

BY PURCHASE. Bucephala Americana from Salem.

C. COOKE.
Assistant.

Peabody Academy of Science,
Salem, December 28, 1872.

APPENDIX TO THE DIRECTOR'S REPORT.

Synopsis of the Thysanura of Essex County, Mass., with Descriptions of a few extralimital forms. By A. S. Packard, Jr.

Having thought it best in order to call attention to this interesting group to throw into a connected form my notes on the known North American species, I submit the following synopsis for the consideration of naturalists.

Most of the species have been collected by myself at odd hours in Essex County, Mass., and in Maine. But little time has been given to searching for them, and it is believed that as many more species of Poduridæ and especially Smynthuridæ will be found in Essex County, as are here recorded. I am greatly indebted to Dr. Josiah Curtis, of Knoxville, Tennessee, for a valuable collection of these forms, which has enabled me to extend the geographical limits of a few species, as well as to bring to notice a remarkable species of Orchesella (*O. carneiceps*).

I wish, also, to acknowledge the receipt of a most valuable collection, presented by Mr. G. W. Belfrage, so well known as a careful and observing collector of insects. These are from Waco, Texas. There are twelve species represented in the collection, with a large number of individuals, forming admirable material for study. It will be seen that *Tomocerus plumbeus* (Otho Fabricius mentions *Podura plumbea* Linn. as an inhabitant of Greenland), *Degeeria* 10-*fasciata* and *Orchesella flavocincta* are found in considerable numbers in Texas as well as Tennessee, Essex County, Mass. and Maine, so that certain species of the group have a wide geographical range.

Other species from Texas, such as *Degeeria perpulchra*, differ greatly from New England forms. The Texan species are on the whole much brighter colored than those inhabiting the Northern States, as would naturally be expected, some being gems of beauty.

During last summer's journey in Europe the collections I was enabled to make in Italy, Switzerland, Norway and Wales, have been of much service to me. It appears that on comparison I can find no difference between European and American specimens of *Tomocerus plumbeus*, *Lipura fimetaria* and *L. ambulans*, while Sir John Lubbock, to whom I had sent specimens of *Anurida maritima*, pronounced them co-specific with the European form of that name. O. Fabricius also records this species as inhabiting Greenland. It is difficult, whatever may be said of the Lipuræ and Anurida, to understand how *Tomocerus plumbeus* could have been an emigrant from Europe; and its occurrence as abundantly in Salem as in Europe, and apparently as much so in Tennessee and the interior of Texas, renders it probable that it is autochthonous both to the United States as well as to the Arctic regions and Europe. It is not improbable that other species are common to Europe and the United States, and that some here described as new to science, may prove to be European species.

The literature of the American forms is exceedingly limited. In 1780, Otho Fabricius in his classical "Fauna Grœnlandica," which we quote, since Greenland is zoologically a part of the North American continent, its fauna being closely related to that of the coast of Labrador and the Arctic regions lying northward, mentions six species as occurring on the west coast, *i. e.*, "*Podura plumbea* Linn., *Podura aquatica* Linn., *Podura ambulans* Linn., *Podura pusilla* Linn., *Podura maritima* Ström., and *Podura humicola* O. Fabr. It seems from this list that none of the Smynthuridæ live in Greenland. No Lepismatidæ or Campodeæ have yet been reported from the Arctic regions.

In 1821 Say (Journ. Acad. Nat. Sciences, vol. 2) described the following species: *Machilis variabilis*, *Podura fasciata*, *Podura bicolor*, *Podura tricolor* and *Smynthurus guttatus*.

None of these except the Machilis, have I as yet been able to recognize from the descriptions. They will undoubtedly be identified when we have collections from their respective localities.

In 1846 appeared the next paper in which the Thysanura are mentioned, *i. e.*, an article, by Dr. Fitch, on the "Winter Insects of Eastern New York" (Amer. Jour. Science and Agriculture, vol. 5, 1846, pp. 274–284). I have not been able to see the original; it was copied by Westwood in the "Trans. Lond. Ent. Soc. (Ser. 2, 1851, vol. 1, Proc., p. 95). Dr. Fitch seems to have copied the portion relating to the "*Podura nivicola*" in the same "Journ. Science and Agriculture" for 1847, p. 145, inserting its description in a "List of Noxious Insects."

In 1862 (or 1863, if, as is probable, the report was presented in 1862 and printed in the beginning of the year), Dr. Fitch in his "Eighth Report on the Noxious and other Insects of the State of New York" described a few additional species, comprising *Smynthurus hortensis*, *S. arvalis*, *S. Novæboracensis*, *S. elegans*, and *S. signifer*.

In 1868, Mr. A. Humbert described, in the "Revue et Magazin de Zoologie," *Japyx Saussurii*, discovered by Prof. Sumichrast in Mexico.

In 1871, I described in the "Proceedings of the Boston Society of Natural History," p. 409, a new species of Campodea, *C. Americana*, the locality being Salem, Mass.; the same date (March) appeared the second memoir of the Peabody Academy of Science, entitled "Embryological Studies on Diplax, Perithemis and the Thysanurous genus Isotoma." In the remarks on the embryology of Isotoma, I refer to a previously undescribed species, *Isotoma Walkerii*.

In the "American Naturalist" for April, 1871, I give, under the caption "Bristle-tails and Spring-tails," a popular account of the Thysanura, based in part on studies of the anatomy of Lepisma and Tomocerus, etc. In this article, as well as in the memoirs of the Peabody Academy, the view is taken that the Thysanura are a group of Neuroptera, both on structural and embryological grounds. A farther discussion of the affinities of the Thysanura is reserved for a final monograph, of which the present essay may be considered a prodromus. In December, 1871, *Campodea Cookei* was described by me from Mammoth Cave. In 1872, in the third edition of my "Guide to the Study of Insects," I added the names to the Podurids figured on plate x, Figs. 2, 3, *Degeeria flavocincta* (this name I change to *Degeeria decem-fasciata*, as being much more applicable, and desire the former to be dropped); Figs. 4, 5, *D. purpurascens;* Figs. 6, 7, *Isotoma plumbea.* Unfortunately the figures of the two Degeeriæ are not particularly characteristic.

The only reference to any of our species in recent European works is by Curtis in his "Farm Insects" (London, 1860), in which he quotes a statement from the "Halifax Times" that "In Nova Scotia the crops of turnips and cabbages are principally destroyed, whilst in the seed-leaf, by some Smynthures, the size of a pin's head, and nearly globular" (p. 433).

Here I desire to take the earliest possible occasion to correct what may produce an erroneous impression of the value of Nicolet's studies on the development of the Thysanura. His observations are more satisfactory than would be inferred from the statements on page 15 of my memoir on Isotoma (2d Memoir of Peabody Academy). I am indebted to Professor Agassiz for the privilege of examining a copy of the rare work by Nicolet* on the "Podurelles," in which the embryology of the Podurids is given with greater detail than I had supposed.

Those stages in the embryology of Isotoma represented by my Figs. 1, 8 and 14, on Pl. 3, are paralleled by Nicolet's Pl. 1, Figs. 5, 7 and 11, illustrating the embryology of *Isotoma cinerea*, a species quite unlike *I. Walkerii*, as the body is shorter, and the spring remarkably short. The most interesting morphological fact he brings out is that the "sucker," just previous to the birth of the insect, "est très-développé et paraît trois ou quatre fois plus gros qu'il ne le sera dans l'insecte parfait." His figures also show that Smynthurus, when first hatched, bears a much greater resemblance to Poduridæ of the same age than the adult, and the figure of the embryo shortly before exclusion from the egg bears a very close resemblance to the embryo of Isotoma of the same age, so that we seem warranted to suppose that the development of the Collembola (Smynthuridæ and Poduridæ) is nearly identical. Nicolet says nothing of the formation of the mouth-parts.

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*Recherches pour servir a l'histoire des Podurelles, par H. Nicolet. (Neue Denkschriften der Allg. Schweizerischen Gesellschaft für die gesammten Naturwissenschaften. Bd. vi, pp. 88. 4to, 1842.

I have designated the spring as the *elater*, and the "catch" for holding the elater in place as the *tenaculum*. This latter organ was first figured and briefly described by Lubbock in Part iv of his "Notes on the Thysanura" (Linn. Trans.), and regarded by him as a catch to hold the spring in place. I supposed it to be, perhaps, an ovipositor, and so described it with a doubt, in the "American Naturalist," vol. v, p. 101. It is homologous with one pair of blades of the ovipositor of the higher insects. It apparently presents good specific and generic characters, as much so as the elater. I only attempt to give the synonymy of the American species.

THYSANURA.

COLLEMBOLA.

Fam. PODURIDÆ (subfamily *Lipurinæ**).

Anura gibbosa, n. sp. A lead-colored or pale indigo-bluish species (of nearly the same hue as *Achorutes nivicola*), with a short, broad body, with short and broad segments; four large subacute tubercles across the upper side of each segment; terminal segment deeply divided, forming two large terminal tubercles. Body with hairs of the same color, thickest posteriorly; the longest of them half as long as the body is wide. The buccal cone is acute, large and prominent, projecting a little beyond the insertion of antennæ, as seen from beneath. Upper surface of the head divided into two areas, the anterior containing three dark squarish patches, the central one much the largest, the hinder area with three small, equal, dark patches. Antennæ very short and stout, as long as half the width of the head; three basal joints subequal in length, fourth longer than others, conical, the joints bearing a few long hairs. Legs short, about half as long as the body is wide, not very stout, claws long.

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*Since this article was sent to the printers I observe that M. T. Tullberg in his "Forteckning öfver Svenska Podurider" has also regarded this group as a subfamily under the same term as I have applied to it.

Length, ·06 inch.

Under bark of hard-wood trees, in crevices of rotten wood; September, Brunswick, Maine (Packard).

Anurida maritima Laboulbène. Podura maritima Linn., O. Fabr. Fauna Grœnlandica, 212. Anurida maritima Laboulbène, Annales Soc. Ent., France. Lipura maritima Lubbock, Notes on Thysanura i–iv. (Linn. Trans. xxiii–xxviii).

Dr. Laboulbène has rightly separated this species from Lipura, etc. It differs in the mouth being slightly produced, the head being more elongated than in Achorutes, while the antennæ are stouter. The eyes are arranged in two groups, three in front and two behind. Antennæ shorter and stouter, terminal joint more conical than in Achorutes. The body is shorter and more hairy than in Lipura or Achorutes; claws large; no tenent hairs, no elater. Uniform dark lead-color, beneath scarcely paler than above.

Length, ·09–·13 inch.

Salem Harbor, floating on seaweed; Nantucket, abundant under stones between tide marks (Packard); below high water mark, Weepeckets Island, Buzzard's Bay (Prof. J. E. Todd, U. S. Fish Commission); Coast of New Jersey (Prof. A. E. Verrill).

O. Fabricius thus speaks of the habits of this species in Greenland: "*Habitat frequens ad littora super aquam marinam in cavernis rupium æstu remanentem, ubi continuo salit, non tamen se submergens. Sub fluxu maris littora petit, mare pacatum expectans.*"

Sir John Lubbock, to whom I had sent specimens for comparison, writes me as follows: "The Lipura maritima seems to me not to differ from our European species. The general form, the antennæ, the feet, the eyes all agree, and I see no sufficient reason for regarding it as a distinct species."

Lipura fimetaria (Linn.). White, naked, with a few scattered hairs. It may be known from *L. ambulans*, with which at first it may easily be confounded, by wanting the hooks at the end of the abdomen, the end being rather blunter in *fimetaria*

I have compared one specimen from Coire, Switzerland, with several of ours and find no difference.

Length, ·06 inch.

Salem (Packard).

Lipura ambulans (Linn.). Entirely white with a few short, scattered hairs. Antennæ much shorter than the head, being about as long as the head is wide, four-jointed, insertion deep, a deep sinus around base of basal joint, which is much shorter than second joint, third short, fourth nearly as long as three basal ones, being much longer than in *L. fimetaria;* articulations between second and third and fourth oblique, especially so between third and fourth joints. Covered with short, stiff hairs, thickest on last joint, legs very short, claws large. The abdomen ends in two upturned, curved, blunt hooks, the last segment being concave on upper surface, especially on sides. A larger species than *L. fimetaria.*

Length, ·10–·15 inch.

Washington, April 24, in Wardian case (Miss D. L. Dix). On comparing my specimens with two I collected at Heidelberg and one from Coire, under stones, sticks, etc., I can find no difference even in slight characters, such as the size and form of supra-anal spines, hairs, proportions of antennæ, etc.

Subfamily PODURINÆ.

Achorutes nivicola. Podura nivicola Fitch, Winter Insects, N. Y. Emmon's Journ. Science and Agr., v, 1846 and 1847, p. 151. Antennæ four-jointed, short, thick, of nearly even width throughout; first joint as long as thick, second and third both of same length, but second considerably thicker; fourth a little longer than third, and but slightly thinner. Feet with a large claw arising from a small joint of the usual form, with a long, slender, tenent hair arising near the claw. The anal appendages appear to be really two-jointed, and consist of two spine-like appendages, with a common base and hollow at basal half. Just below their middle is a joint, with a very slightly marked suture externally. They are borne on a broad triangular tergite (that of the sixth segment), while low down on the side of the body are the anal valves, rounded and small compared with the tergite. Tenaculum with basal joints quadrate in profile, the external edge being a little roughened. From between them project V-like a pair of short, subtriangular blades, a little longer than broad, and with four large teeth on the under side. Elater short and broad, the two finger-shaped joints about twice as long as thick; second joint very minute, consisting of a thin lobe rounded at tip and a little uneven on lower edge, and with a prominent spine at base; two hairs on inside of basal joints. Dark lead color, above and beneath. Body long and slender, abdomen rather suddenly contracting just before the three terminal segments.

Length, ·08–·10 inch.

Hundreds of specimens seen with no appreciable variations. Very young, white.

March, on snow (C. Cooke); under bark of trees, Salem, May 28 and June 6. (Packard.)

Achorutes boletivorus, n. sp. A much smaller species than *A. nivicola*, being about half the size, with a rather thicker body and the head a little smaller in proportion to the body. Antennæ shorter, the joints shorter, subspherical, terminal joints ovate, much shorter than in the other species. Eyes conspicuously black. Legs proportioned same as in *A. nivicola*, ending in long sharp claws; elater as well developed as in *A. nivicola*. Pale gray above, with a slight greenish tinge, on the under side of the body lined with white, with scattered gray specks on side of body. Supra-anal spines rather longer than in *A. nivicola*.

Length, ·05–·07 inch. 100–200 specimens examined.

Sept. 10, very abundant, on under side between lamellæ of Boleti and Agaricus, hundreds on one plant, Brunswick, Me. Salem under a heap of horse manure, Aug. 15 (Packard).

Achorutes marmoratus, n. sp. Allied in form of body and the size of elater to *A. pratorum*, though rather slighter. Pale gray marbled with large lilac gray patches; pale beneath. Hairy as in *A. pratorum*, but the hairs longer and stouter. Antennæ much as usual. Legs much the same, but the claws longer. The supra-anal spines are of the same size, being large and long. Elater not quite so long as in *A. pratorum*, the third joint being shorter, ovate.

Length, ·05 inch.

Two specimens. Brunswick, Maine, Sept. 10th (Packard).

This species may at once be recognized by its pale lilac gray color, laid on in patches, and by being of rather slighter form than *A. pratorum*, the antennæ and limbs being slenderer, while the spring is rather shorter.

Achorutes Texensis, n. sp. A dark lead colored species, of the same hue as *Achorutes nivicola*. Body short and stout, much as in *A. pratorum*, with similar, long, curved, anal spines; hairs rather long and stout; antennæ and legs as in *A. pratorum*. Elater well developed, much as in *A. pratorum*, but twice as large and with the third joint still larger in proportion.

Length, ·04–·05 inch.

Waco, Texas (Belfrage). Ten specimens.

Apparently a smaller species than *A. nivicola* or *pratorum*. This species resembles the former in color, and the latter structurally, but may be distinguished by the much larger spring, it being twice as large in a specimen two-thirds the size of *A. pratorum*.

Achorutes pratorum, n. sp. Allied to *A. nivicola*, but much shorter and considerably smaller, being half as large as in that species. Head larger in proportion to the rest of the body than in *A. nivicola*. Antennæ shorter, terminal joint short, conical, not so long as in *A. nivicola*, and basal joint much shorter. Segments shorter. Legs much as in *A. nivicola*, with large claws. The two supra-anal upcurved spines much stouter and larger than in *A. nivicola*. But the most important difference is in the form of the elater, which accords with its living in open fields and being more active in its habits. It is much longer and slenderer, the second joints long, slender, cylindrical, distinctly separated by suture from base; third and terminal joint much longer and slenderer than in *A. nivicola*. Hairs on body rather more numerous than in *A. nivicola*. Body dark lead color, but considerably lighter than in *A. nivicola*, with dark eyes, and a lateral row of dark irregular spots, one to each segment. Body paler on under side.

Length, ·04 – ·06 inch.

Orono, Maine, on surface of pools; after a rain, in grounds of Agricultural Coll., Orono, Maine, July; Brunswick, Maine, Sept. 10 (Packard).

Isotoma nivalis, n. sp. A species combining some of the characters of Lipura, Achorutes and Isotoma; head similar in shape to Lipura. Antennæ slender, four-jointed, very slightly longer than head, joints much longer but proportioned as in Lipura. Body long and narrow. Segments long, of equal length. End of body much rounded. Sucker well developed, much as in Lipura. Elater much shorter and smaller than usual, projecting half its length beyond end of body. Second joint long and slender. No scales on body, which is as naked as in Lipura. A perfectly flesh white species, of the same color, and at first sight would be easily mistaken for a Lipura, having the general form of that genus, but being much slenderer, and having a well developed spring. There are one or two stout hairs to each antennal joint, and a stout hair on each side of each abdominal segment.

Brunswick, Maine, Sept. 10, under bark, common. Salem, under flower pots in house, March (Packard).

Length, ·09 inch.

Isotoma albella, n. sp. A remarkably long, narrow, slender species, though not quite so slender as the preceding. Head rather longer than broad, rounded in front, not square. Antennæ just twice as long as the head. four-jointed, the joints slenderer than usual, second joint slightly curved, terminal joint long, oval, cylindrical, fully a third longer than third joint. Body almost naked, hairs very short, a few longer hairs on terminal segment. Elater long and slender, though shorter than usual in the genus, extending beyond end of body by a distance equal to greatest breadth of abdomen; each division gradually tapering to the end, which is acute and slender, upper edge very minutely sinuate, the teeth rounded; third joint difficult to distinguish, very minute and ending in a hooked point, with a supplementary tooth on upper side just beyond middle. Two stout hairs or spinules at base between the forks. Sucker nearly as long as body is thick. Feet with supplementary claw fully half as large as the large one. Dull white throughout, eye patches long and narrow.

Length, ·06 inch.

Salem, Mass., May 26, under bark; Brunswick, Maine, (Packard).

The only white species of the genus yet known to me except *I. nivalis*, from which it differs by the longer spring. It is easily recognized by this character and its long body and slender antennæ.

Isotoma leonina, n. sp. This species differs from *I. albella*, to which it is closely allied, in its tawny yellow color, and in the square head, that of *I. albella* being well rounded. The antennæ are shorter, the fourth joint less attenuate at base; the eyes are broader, black, conspicuous. The elater is of the same relative length, but a little slenderer at the end than in *albella;* serrulate beneath, the third joint with a large supplementary tooth; claws much as in *I. albella*. It is rather smaller than *I. albella*, and may at once be known by its tawny, snuff yellow color.

Length, ·05–·06 inch.

Salem, Mass., under bark in March and April, very abundant (Packard).

Isotoma glauca, n. sp. A bluish gray species, very slender, intermediate in form between *I. albella* and the stouter species, *I. tricolor*, etc. Head shorter than in *I. albella*, eye patches black, conspicuous, broader, less linear than in *I. albella*. Antennæ much shorter and stouter than in *I. albella*, basal joint one-half shorter than in that species, second and third joints much more dilated distally. Body a little more hairy than in *I. albella;* spring of much the same size and proportions; the lower edge finely serrulate, with rounded teeth, and the terminal joint, as in *I. albella*, ending in a curved hook, with a supplementary one near it, much as in that species. The spring is slightly more hairy. The feet and tarsal claws are much as in *I. albella*, but the tibiæ have stouter spinules. Sucker as long as the thoracic segments are thick.

In two specimens I have observed the tenaculum. When retracted its side is indicated by a flattened, conical swelling, with two stout hairs arising from each side. When extended it has the same general structure as in the tenaculum of *Achorutes*, but is much longer and slenderer; the basal portion or valve is about twice as long as broad, square at the end; the second joint or valve is very narrow, half as long as first joint is wide, with about four rounded teeth along the inner edge.

Length, ·05 inch.

Found very abundantly under bark in excrement of boring beetles. Salem, Mass. (Packard).

This species differs from *I. albella*, its nearest ally, in its stouter, shorter body and antennæ, and broader eye patches, and its bluish gray color.

Isotoma Belfragei, n. sp. This is the largest species of the genus yet known in this country. Its body is rather long and slender, and it belongs to the section of the genus connecting the slender species *I. albella*, *I. glauca*, etc., with *I. plumbea* and *purpurascens*. It is pale lilac, deeper on the hind edges of the segments, antennæ darker, purplish. Legs concolorous with the body. The antennæ are rather long and slender, much more so than in *I. purpurascens*. Body moderately hairy. Eye patches black, connected in front by a curved line; V-shaped suture behind, black. Elater long and slender, second joint serrulate beneath, the teeth rounded, hairy, the terminal hair exceeding the third joint; the latter of the usual shape; the supplementary tooth nearly as large as the terminal one. Tenaculum intermediate in form between *I. glauca* and *I. purpurascens*, but nearly as hairy as in the latter, the second joint unusually slender, with four teeth.

Length, ·12 inch.

Waco, Texas (Belfrage). Fifteen specimens.

Easily recognized by its unusually large size, slender, pale lilac body, and rather slender antennæ.

Isotoma Walkerii Pack. Memoirs Peab. Acad., 2, 1871, p. 19. Dull greenish snuff-yellow. Antennæ with third joint smaller and shorter than second, which is longer than first; terminal joint long, ovate, equalling in length the second and third taken together. Abdomen broadest just before the end. Elater arises from a short stalk, while the fork is long and slender, the branches being bowed outwards near the base.

Length, ·04 inch.

Found abundantly in spring and again in November, and the following spring again, under the bark of the same tree.

Chelsea, Mass. (C. A. Walker).

Isotoma tricolor, n. sp. Dark pea green, body rather thickly hairy, hairs frosty white, with a few hairs much longer than the others on the terminal two-thirds of the abdomen. Antennæ with two basal joints greenish at base, purplish at tip, two distal joints purple; joints of antennæ gradually but slightly increasing in length, the terminal joint less ovate, being long and slender. Legs throughout amber color; claws very unequal, outer claw large and inner small and one-third shorter; no tenent hairs, tarsi in structure like those of Lepidocyrtus. Elater hairy, amber yellow, greenish on basal joint. Eyes conspicuous, black, eight ocelli, very convex, arranged obliquely in pairs. Upper surface of body shows metallic reflections.

Length, ·08 inch.

Museum grounds, Nov. 10–24, Salem (Packard).

Young ones are paler green. This is our largest and commonest species and easily known by its dark green body. Ten specimens from Texas (Belfrage) do not differ from those from Mass. They are perhaps paler clear green, but the spring and markings on the body do not apparently differ.

Isotoma purpurascens, n. sp. This very abundant species is structurally very closely allied to *I. tricolor*, but differs in the body (including the antennæ and legs) being bathed with reddish purple; the antennæ are short and stout, the body very stout. Head with black eye patches; with a black line connecting them in front, and the V-shaped suture behind usually black. Posterior edge of segments darker than rest of body. The body hairy. Elater white, hairy, with the terminal hair projecting a little beyond the end of third joint; this joint much as usual, about twice as long as broad, with a stout curved terminal hook and inner stout tooth. The tenaculum has the basal joint very hairy, subquadrate, a little longer than broad, being wider than in *I. glauca*, and with the second joint long and slender, two-thirds as long as the basal joint is wide, of the usual shape, with five teeth.

Length, ·08–·09 inch.

Very abundant. Fifty specimens, Texas (Belfrage).

This species resembles *I. plumbea*, but is rather stouter, with shorter antennæ, and differs in color.

A variety is of a peculiar cloud gray color, with slenderer antennæ, and a row of dorsal spots across each abdominal segment.

Isotoma plumbea Pack. Guide to Study of Insects, third edition, Pl. 10, Figs. 6 and 7. In this species the head is smaller, more rounded, while the antennæ are considerably longer and slenderer, the second and third joints being each a third longer than in *I. tricolor*. It is also apparently a larger species. Body and antennæ of a uniform leaden purple; spring paler, much as in the other species, the terminal joints ending in two large curved hooks.

Length, ·10 inch.

Chelsea, Mass. (C. A. Walker).

This fine species, the largest yet known from New England, may be recognized by its purplish lead color, the rounded head, and the long second and third antennal joints; the body is thick and heavy.

Isotoma? humicola. Podura humicola O. Fabr. Fauna Grœnlandica, 213. Fabricius says of this form that the antennæ are short, scarcely longer than the head, thick, four-jointed, with the last joint longer and slenderer than the others. Spring when extended scarcely to be seen beyond the anus. It is reddish blue in color, and scarcely a line long. It may yet prove to be an Achorutes.

Podura aquatica Linn. O. Fabr. Fauna Grœnlandica 211, (1780). Fabricius merely says of this species, "*Podura nigra aquatica. Habitat in stagnis.*"

Lepidocyrtus marmoratus, n. sp. Body densely scaled. Pearly white, tinged with a pale salmon color, marbled with irregular brick-red blotches, extending to basal half of elater, and basal joint of antennæ and to the femora. Outer half of elater, tibiæ and tarsi pearly white. Antennæ with the three basal joints of the same length, fourth twice as long as third; two terminal joints whitish. Eyes reddish. Peculiar club-shaped hairs on head and prothorax, with scattered hairs on the rest of the body. The clubbed hairs, forming a ruffle behind the head, end in a peculiar point; similar hairs project between the antennæ over to the front edge of the head, while slenderer hairs ending in an elongated knob are scattered over the abdomen. Under a $\frac{1}{5}$ objective all these hairs are seen to be finely fringed. Basal segment of abdomen rather shorter than second; third twice as long as second. Larger claw armed with a single minute tooth, at base.

Length, ·06–·08 inch.

Common in grounds of the Academy Museum, Salem, Nov. 2–Dec. 25 (Packard).

This little creature cleans its antennæ by drawing them through its jaws, probably between the maxillæ.

Lepidocyrtus metallicus, n. sp. A stout-bodied species with rather short antennæ; dark blackish bronze, giving off metallic and purplish reflections; antennæ pale purple, legs and spring whitish. Antennæ with the three basal joints no longer than the head, sometimes shorter (in three examples the third joint is only half as long as the fourth, in two others it is two-thirds as long). Hairs on prothorax rather short, broad. Body densely scaled, the scales oval lanceolate; broadest on the elater; the hairs at the end of the body short and thick. Elater rather short and thick, very hairy and scaled, second joint serrulate on under side; the simple portion shorter and much broader than usual, not bent; the third joint larger than usual, very distinct from the rest of the elater, ending in a long slender hook, two well marked inner hooks, the middle one nearly as long as the terminal one. Legs hairy. Claws very uneven, the larger unusually broad, the smaller narrow.

Length, ·07 inch.

Brunswick, Maine, May 10th; Salem, March–Dec. (Packard).

It may be readily recognized by the dark purple bronzed, densely scaled body, and the stout scaled elater. Eight specimens. A common species running about under stones, bark, etc. Very agile in its movements. This may prove to be *Podura pusilla* Linn., cited by O. Fabricius.

Lepidocyrtus pusillus. *Podura pusilla* Linn., O. Fabr., Fauna Grœnlandica, 212 (1780).

Lepidocyrtus albus, n. sp. A short-bodied species with short antennæ, and a short, oval, cylindrical body. Uniformly pale yellowish white, less hairy than usual. Antennæ, feet and elater, concolorous. Eye patches small, black; antennæ short, three basal joints equalling length of head, third joint unusually short, oval, one-half as long as the fourth joint. Legs small. Elater short and stout; short regular curved hairs along under serrulate edge; end of second joint narrow, free from teeth, this simple portion longer than usual, scarcely bent so much as usual. The terminal straight hair not so long as usual, not reaching much beyond the middle of the third joint. This latter joint rather long and narrow, ending in a small incurved hook as usual, with an inner hook nearly as large as the terminal one.

Length, ·04 inch.

Brunswick, Maine, Sept. 10 (Packard); Knoxville, Tenn. (Dr. J. Curtis). Twelve specimens.

It may be known by its yellowish white body, and unusually short, oval third joint of antennæ.

Lepidocyrtus bipunctatus, n. sp. A large yellowish species with prominent black eye patches; the body is mottled with brown scales above, which are often arranged in transverse bands; a large black round dot on each side near the elater (these spots are always present, the brown scales are often rubbed off). Antennæ and legs concolorous with the body, the end of antennæ (fourth joint) a little dusky. Elater paler than body, but not white. The antennæ are very long and slender. Scales numerous, broad ovate almost square, or lanceolate oval. The hairs on head and thorax numerous, clavate. Claws moderately stout, much as usual in the genus, the tenent hair long and slender, scarcely swollen at tip. Elater rather hairy, the terminal hair reaching to end of third joint; with long lanceolate scales near the end; second joint deeply serrulate, the teeth well rounded; the simple extremity scarcely twisted; third joint as usual, but with no well marked inner tooth, it being rudimentary.

Length, ·08–·09 inch.

Texas (Belfrage). Abundant, fifty specimens.

This fine large species may always be recognized by its uniform yellow color and the two conspicuous black dots near the base of the spring.

Tomocerus plumbeus. Podura plumbea Linn., O. Fabr., Fauna Grœnlandica 211 (1780). Tomocerus plumbeus Templeton. Body above uniformly dark lead color, obscurely marbled with paler spots; with dull metallic reflections. Beneath paler, being of a dull horn color; antennæ beneath of the same hue. The hairs beneath give the body and appendages a frosted appearance, while the hairs above are concolorous with the upper side of the body, though inclined to be slightly darker.

Length, ·10–·14 inch.

Brunswick, Maine, Sept. 10; Salem, Mass., under sticks and stones, museum grounds, Sept.–Dec. (Packard); Salem in sweepings of cellar (Emerton); Knoxville, Tenn. (Dr. J. Curtis); Texas (Belfrage).

Though the Texan specimens are rubbed, I cannot perceive any difference of importance between specimens from the above named localities. After a comparison of specimens collected in Europe at different points, I can also find no differences. In the details our specimens agree well with Lubbock's description.

Degeeria perpulchra, n. sp. An exceedingly beautiful species, smaller than usual. Body rather ovate in form, third abdominal segment rather long. Antennæ rather short and thick, and more hairy than usual; third joint rather shorter than the fourth, the latter joint rather more ovate and pointed than usual. Clavate hairs on the head and thorax; end of the body and elater quite hairy. Antennæ purplish, concolorous with the head and thorax. A broad conspicuous black line runs along the side of the head including the eyes; a similar line on front and side of thorax. A much broader conspicuous black dorsal band on third thoracic (the first or prothoracic not seen from above) segment. The abdomen and basal half of the elater honey-yellow. End of elater whitish; lower edge of second joint rather coarsely serrulate, the joint dilated where the teeth end, beyond simple, flexed as usual; this portion not so long and slender as in many species; the terminal hairs do not reach to the end of the third joint; this latter joint much as usual, with a stout long terminal tooth and a slender, long inner tooth. Legs whitish. Claws very slender, smaller one scarcely more than half as long as the larger, a single large tenent hair, unusually swollen at the extremity. No scales.

Length, ·04–·05 inch.

Texas (Belfrage). Frequent, ten specimens. This exquisitely pretty form may be at once known by its small size, the black band around the head and on front and side of thorax, and the honey-yellow abdomen.

Degeeria griseo-olivata, n. sp. Pale olive green with dark purplish leaden antennæ, the legs much paler, purplish; elater whitish. Body above hairy, especially on the thoracic segments. Eye patches black, connected by a slender black line in front. A blackish line (sometimes wanting) along the lower edge of the segments and hinder edge of last abdominal segment. Antennæ rather stout, moderately long. Posterior end of body with rather stout clavate hairs, with a few long bowed hairs scattered among them. Elater with several long hairs at end, one longer and larger than the others and reaching a little beyond the end of the third joint. The second joint is serrulate along lower edge; it suddenly narrows a little before the end and is a little curved; third joint about three times as long as wide, ending in a large hook, with a much smaller supplementary tooth.

Length, ·05–·06 inch.

Salem, March 14th, and all the year round except Jan. and Feb. Museum grounds and under bark of trees (Packard).

It may be known by its pale olive green color, purplish antennæ, and the bent slender end of the elater, with the long stiff hair projecting beyond it, and the dark border on lower edge of segments. Our most common species; twenty-five specimens living and alcoholic. In one specimen the third joint of the spring is normal on one side, but on the other is split in two, each half bearing a terminal and the usual supplementary, inner tooth!

Degeeria purpurascens, Pack., Guide to Study of Insects, Pl. 10, fig. 4, 5. (Poor figures, antennæ too short.) Eyes black with no connecting line. This is rather a large species with unusually long, slender antennæ, with the body, legs and antennæ of a purplish lead color, the purplish tint especially noticeable on the two basal joints of the antennæ. Not very hairy; the hairs on the prothorax and head of quite uniform length, club-shaped, those on the posterior end of the body very slender, no bowed ones among them (though my specimens are somewhat rubbed). Legs slender, claws long and slender, larger claw with two acute prominent teeth along the inner edge. Elater with long dense hairs along upper side of second joint; serrulate, the teeth suddenly ending, leaving the end narrow, slender, naked, slightly bent, with a long hair projecting beyond the tip of third joint. This joint rather short, much curved on the outer side, ending in a rather slender hook, with an inner one of nearly the same size. "Catch" large; basal joint longer than broad, with a stout bristle arising from middle of anterior edge and reaching nearly to tip of second joint, both front and hind edge with three or four notches, second joint very slender on the toothed portion, four-toothed; whole joint over half as long as first joint.

Length, ·08–·09 inch.

Brunswick, Maine, Sept. 10; Orono, under boards on banks of Penobscot river, in July (Packard); Knoxville, Tenn. (Dr. J. Curtis). Salem under bark of trees (Packard).

Known by its very long antennæ, its uniform purple lead color and structure of elater, etc. Twenty specimens.

Degeeria decem-fasciata, n. sp. Body pale greenish yellow, with ten transverse dorsal black stripes, more or less marked, including the band connecting the eyes; also an irregular rather wide band runs along the lower side of the body from the eyes to the penultimate dorsal band. Antennæ unusually long and slender, varying much in length; pale purple, but darker at end of last two joints. Legs purplish. Body beneath uniformly pale greenish yellow. First dorsal abdominal band narrow and faint, the two succeeding heavier, and at each end produced anteriorly; the two succeeding these are divided in the middle, and still more produced anteriorly. End of body black above and beneath. Body hairy on anterior half, with a collar of projecting hairs. Elater hairy, the under side serrulate, as usual; the simple terminal portion long and narrow; third joint with the two hooks as usual.

Length, ·08 inch.

Maine, Salem, Mass. (Packard); abundant on windows of houses, Knoxville, Tenn. (Dr. J. Curtis); Texas, very abundant (Belfrage). Fifty specimens.

This is a very variable species, but may be easily recognized by the dark banded or sometimes spotted body, and the purple antennæ. It is not very characteristically figured in the "Guide to the Study of Insects," third edition, Pl. 10, fig. 2, 3, under the name *D. flavopicta*, which is inapplicable, and which I desire to have dropped.

Orchesella carneiceps, n. sp. Though the ends of the antennæ in three specimens are wanting, I venture to describe this singular species, as its characters are so marked. The body is of a rich deep velvety umber brown and very hairy, while the head is pale flesh colored, with conspicuous black eyes, and brown hairs like those on the body. Antennæ whitish, ringed with black, or almost wholly black at the ends of the first and second joints (remaining joints wanting). Legs brown, interrupted with white patches; claws very unequal, the larger one long and slender, with three spinules on inner edge; smaller claw half as large and half as long as the larger one. A single long tenent hair arises near end of tibial joint. Hairs on head and thorax long, clavate at tip. Elater very hairy; several hairs on spinules project beyond the third joint, and one to a distance equal to the length of the joint itself, which is rather long, ending in a long hook with a slender long inner tooth.

Length, ·10 inch.

Knoxville, Tenn. (Dr. J. Curtis).

Orchesella flavo-picta, n. sp. Body blackish gray with metallic reflections above, dull whitish beneath, above with dense gray hairs extending from the top of the head to the middle of body, thicker and extending farther back than usual. Behind are four rows of similar hairs along edge of segments, two being on the tip of the abdomen. Antennæ six-jointed, basal joint very short, not so thick as second; second long, a little thickened towards end, yellowish; third very short, no longer than second is thick, dark brown; fourth long, nearly as long as second, pale reddish brown, terminal third dark brown; fifth slenderer than fourth and a quarter longer than fourth; pale brown color with a purplish tinge, sixth slenderer than fifth, acute, and of same length as fifth joint. On each side of the three segments (exclusive of prothorax) behind the head is an oblique short bright yellow stripe, and the hind edges of these segments are yellowish. Legs yellowish at base, tibiæ reddish brown; beyond the base, which is yellowish, a reddish band near the end of femora. On fifth segment behind the head a conspicuous bright yellow, lunate, dorsal band. A narrower bright yellow transverse band on hind end of seventh segment. Elater extends to sucker, whitish, slightly yellowish at base. The sucker can be extended out to a length equal to thickness of body; clavate, the knob-like end divided into two slightly marked lobes by the median line.

Length, ·12–·16 inch.

Eagle Island, Salem harbor, July 14. Not uncommon. Dec. 14, under a net box in museum grounds, Salem, and on palings all summer and early in autumn in damp weather (Packard). Albany, N. Y., under bark of stumps and Salem, Mass, (J. H. Emerton); Knoxville, Tenn. (Dr. J. Curtis).

This is a very variable species in color but may be known by its dark spotted or banded body, and the parti-colored antennæ. It is often almost wholly black, with a single broad yellow band on the second abdominal segment, or on second and third thoracic in addition. In a number of specimens from Texas (Belfrage) the head is pale, the eyes distinct, not immersed in a line, while the posterior half of the body has a faint reddish brown tinge, but I am inclined to regard these forms as indicating but a variety, as the markings are otherwise the same, and this is a very variable species.

Family SMYNTHURIDÆ.

Papirius marmoratus, n. sp. A large and beautiful species marbled over with deep dull lilac and pearl colored lines and spots. A median dorsal pearly streak along the basal half of the abdomen. Eyes black. Antennæ dull lilac, paler on basal half Legs dull lake; femora pearly at base and end; tibiæ alternately light and dark lilac. Body beneath light pearly, mottled with lilac. Elater pale lilac; in the young, whitish. Body rather elongated. Head large, free from the body, swollen on the side and over the clypeal region. Body elongate oval, with two pale smooth small tubercles on each side of the middle of the basal abdominal segment. The two following segments narrow and projecting far out like a fungoid growth. Antennæ somewhat as in the European *P. cursor* Lubbock (see Trans. Linn. Soc. Vol. xxiii tab. 45, fig. 15) but the third joint is divided into numerous smaller joints of which sixteen can be distinguished, the subjoints on terminal half of main joint being much swollen, and the terminal joint longer and divided into more joints. Third joint of elater long and slender, not diminishing at oval tip, or spatulate in form; second joint serrulate beneath.

Length, ·10 inch.

On toadstools, abundant at Brunswick, Maine, Sept. 10, and Wood's Hole, Mass., Sept. 15 (Packard); vicinity of Boston (F. G. Sanborn). Fifteen specimens.

This fine marbled species may be known by its decided lilac hue and median pale line, as well as the two pale dorsal tubercles and its large size.

Papirius Texensis, n. sp. Of the form of *P. marmoratus*, to which it is closely allied; the body is subtriangular, being in many of the specimens dilated broadly behind (appearing much as in Lubbock's figure of *Smynthurus viridis* Tab. 21, fig. 1, Linn. Trans.). It is pale luteous, spotted with black dots and marbled with brown, in older specimens becoming brown marbled with whitish. In these brown specimens there is a broad pale area between the antennæ, and a light line along the middle of clypeus. Eyes conspicuously black. Two conspicuous black dots on each side of middle of back of body. Antennæ pale reddish brown, growing darker towards the end. Elater with remarkably long and large stout hairs on the second joint; third joint long lanceolate oval, end moderately obtuse; both edges minutely serrulate. A few large long stout hairs on the head and base of the body. Claws with three teeth on the edge of larger claw (not so well marked as in *P. marmoratus*); smaller claw much dilated at base, the rounded dilation bearing a hair; the end of the claw much attenuated.

Length, ·06 inch.

Waco, Texas (Belfrage). Twenty-five specimens.

Very closely allied to *P. marmoratus;* but it is more hairy, the body more finely marbled, appearing as if tuberculated, while the skin of *P. marmoratus* is smooth; it also wants the two pale smooth tubercles on the body of the latter. Some specimens have a reddish and others a greenish hue. It is a very variable form.

Smynthurus roseus, n. sp. Body short and thick, rounded, roseate all over, with black eyes, and scattered pale hairs on the abdomen, especially towards the tip. The antennæ and legs are very hairy, the antennal hairs being rather dense and very long. Antennæ dusky on outer half. Feet pale roseate. Head rather large. The fourth joint of antennæ is divided into nine subjoints from which arise two hairs on each side, giving a subverticillate appearance to the antennæ. Third joint more than one-half as long as last. Head large in proportion to the abdomen. General color deep delicate roseate, very minute and agile.

Length, ·01 inch.

Nov. 1–Dec. 3, in museum grounds, Salem (C. A. Walker).

Smynthurus elegans. Fitch, Eighth Report on the Noxious and other Insects of New York, p. 192, 1862. S. signifer Fitch, *l. c.* p. 193, 1862. Greenish with a yellowish hue, with black lines and irregular patches. Head large, body oval, with a small prothorax, but with the meso- and metathorax well developed. Abdomen globular, composed of four segments, the second small, wedge-shaped seen laterally, the third as long as entire thorax. A few minute scattered hairs. Antennæ reddish, pale at base, second and third joints long and slender, of very equal length, fourth as long as two succeeding joints, with long hairs, often in pairs, arising at regular intervals denoting subsegments nine in number. Eyes black. Body with no supra-anal projection. Legs a little paler reddish than antennæ. Claws simple stout hooks, inner slightly smaller than outer, two tenent hairs at base, approximate and arising from tip of tarsal joint, and ending in a transparent bulb. Elater projects about half its length beyond the tip of abdomen. The third and last joint is half as long as second, simple, with no hairs. Fork longer than the base, terminal joint flattened at the base, acute towards the tip, two or three scattered hairs on fork, and second and third on base. The young are pale greenish yellow, pale beneath, two subdorsal and two lateral dark olive green lines, which become broader in older specimens, and a median interrupted dorsal line is added, while the longitudinal bands increase in width with age until the upper side of the body becomes greenish black with yellowish lines between. On the head is a dark median line. Eyes conspicuous, black, and a transverse stripe in front of the antennæ. In adult specimens the head above is black green with two yellowish lines on each side of the median black line. Antennæ reddish at basal half, outer half dusky, elbowed slightly in the middle, a little over half as long as the body. Head, body and limbs with scattered minute hairs.

Length, ·03 inch.

Common under chips, etc. Grounds of museum of Peabody Academy, Nov. 10–20 (Walker and Packard); Knoxville, Tennessee (Dr. J. Curtis).

Smynthurus 4-*signatus*, n. sp. Of a delicate uniform dark olive green; antennæ, legs, and elater of the same hue. Head paler, luteous on top, eyes large, conspicuously black. On middle of the back of abdomen four sinuate pale lines arranged in two pairs; those on anterior pairs much shorter than the two posterior ones, a remote pair of pale dots some distance behind. Head large, nearly as wide as body. Antennæ of the usual form. Supra-anal bunch very prominent and slender. Elater spinulated, as usual, with the third joint moderately long, oval lanceolate, apparently smooth on lower edge, end ovate, not very acute.

Length, ·05 inch.

Brunswick and Orono, Maine, in June and July (Packard).

I think that it occurred on the flowers of the dandelion; at least one dark species is very abundant on them in Maine.

This pretty species may at once be recognized by the dark soft olive green body and the four waved pale lines on the top of the back. Eight specimens.

The following species I have not seen:—

Smynthurus hortensis Fitch, Eighth Rep. Ins. N. Y., 1862, with a figure. New York. In fields of young wheat and rye in May and June.

Smynthurus arvalis Fitch, *l. c.* 191. On leaves of clover, apple, etc., in May and June.

Smynthurus Novæboracensis Fitch, *l. c.* 192. New York. November.

The following species I have not yet been able to identify:—

Podura fasciata Say, Journ. Acad. Nat. Sci., ii. 12 (1821). Under the bark of decaying live oak, Georgia and East Florida.

P. bicolor Say, *l. c.* 13. "Our most common species, under stones, etc."

P. iricolor Say, *l. c.* 13. "Inhabits Pennsylvania, common."

Smynthurus guttatus Say, *l. c.* 13. Georgia.

Family JAPYGIDÆ.

Campodea Americana Pack., Proc. Boston Soc. Nat. Hist., xiii, 409 (1871). This species is exceeding near to *C. fragilis* Meinert (= probably *C. staphylinus* Westwood). It is yellowish white. Antennæ twenty-jointed, with the basal joint short and about one-fifth broader than the succeeding ones, and about one-half as long as broad; obliquely truncated. Caudal appendages long and hairy, the joints gradually increasing in length until the terminal one is lanceolate, oval and nearly as long as the tenth abdominal segment is broad. The hairy single-jointed tarsus is as long as the tibia, and ends in two long equal curved claws. Prothoracic segment considerably narrower than the head, about half as long as broad, sublunate, much rounded behind; mesothoracic segment as round as the head, well rounded in front, very free from prothoracic segment, under which it moves; hinder edge square, slightly rounded. Metathoracic segment square in front, a little rounded behind, especially on the sides.

Abdominal segments very equal in length, with the sides a little produced posteriorly, terminating in a bristle. The abdominal lateral locomotive spines slender, acute, two-jointed, the basal joint a little longer than broad; second joint moving like a finger backwards and forwards, acting both as abdominal supports and as locomotive organs. The head and body are covered with fine yellowish hairs.

Length, ·12 – ·20 inch.

Salem, Mass., under stones and logs in damp soil, April, (Packard). Chelsea, Mass. (C. A. Walker).

I have, through the kindness of M. Meinert, assistant in the Zoological Museum of the University at Copenhagen, been able to compare our species with his *C. fragilis* from Denmark, and it is difficult to find differences that are specific. The antennæ of *C. Americana* have shorter, rather stouter joints; the joints of the caudal appendages are rather longer and slenderer in *C. fragilis*, while the hairs on the body of *C. Americana* are very slightly longer. These differences are, however, so slight, that on comparison of a greater number of specimens the two species may prove identical. We should also know more about the European species of the genus. A specimen which I collected at Vienna, in company with Dr. Brauer, though with the antennæ and caudal stylets broken off, appears to differ specifically from *C. fragilis*. Until, then, the European species have been carefully distinguished, and we know wherein the specific characters consist, we shall regard the American and North European forms as distinct.

C. Cookei Pack., American Naturalist, v, 747 (1871). Closely allied to *C. Americana*, but it is much larger; the antennæ are twenty-four instead of twenty-jointed as in *C. Americana*, and reach to the basal abdominal segments, while in *C. Americana* they reach only to the second thoracic; the terminal joints are much longer than in that species, the penultimate joint being one-third longer. Terminal abdominal segment longer and slenderer; and hind femora longer than in *C. Americana*. Entirely white; pilose.

Length, ·25 inch, the largest *C. Americana* being ·12–·20 inch long (caudal stylets wanting).

Mammoth Cave (Cooke).

The other genus (Japyx) of this family has not yet occurred in the limits of the United States. A species, however, *Japyx Saussurii* Humbert, Rev. et Mag. Zoologie, Paris, 1868, p. 345, was discovered in Mexico by Prof. Sumichrast, and it should be looked for in Texas and the neighboring states.

Family LEPISMATIDÆ.

Lepisma saccharina Linn. Our specimens agree with Lubbock's description of *L. saccharina* (Notes on Thysanura, iv). This species may be known by its narrow body, short antennæ and palpi, and the short caudal appendages; by the minute, remote eyes, smooth, scaled body; by the long telson, which is longer than broad, truncate at end, and far overreaching the base of the caudal stylets; and by the small narrow femora.

The body is uniformly dull silvery, with pale yellowish antennæ and feet. Head with fine scattered hairs; caudal stylets finely hairy, with a few larger hairs, but none so large as in *L. 4-seriata* and other species. The longer caudal stylets are about half as long as the body; antennæ about two-thirds as long as the body.

Length, ·32 inch.

Salem, in houses (Packard). Georgetown, Mass., under boards covering a well (E. Nelson).

Lepisma collaris Fabr. This is described by Gervais as being "black, neck and arms white, as well as the head; feet pale." From the Antilles. He says it is related to *L. saccharina* Drury, Ill., ii, 70, pl. 37, fig. 5. Drury's specimens were from Antigua.

Lepisma quadriseriata, n. sp. ♂ and ♀. Body rather narrow, wider than in *L. saccharina?* and narrower than in *L. domestica*. Eyes moderately large, elevated, with about twelve facets. Maxillary palpi of moderate length, terminal joint much swollen, antennæ a little longer than the body; caudal stylets as long as the body; sterna not fringed with hairs. Body stone-grayish brown, due to pale horn-colored scales mingled with blackish ones. Along upper side of abdomen four rows of subdorsal, dull flesh colored, squarish spots, each giving rise to several hairs, which like all the rest on the body are rich silvery. Abdomen darker than rest of the body. Antennæ and legs pale horn color, with a reddish tinge; quite hairy, but not so much so as the anal stylets, which are densely hirsute. Caudal appendages at intervals of a few joints ringed with paler, and throwing off a long hair. Head, thorax and palpi, flesh colored. Under side of abdomen very densely scaled and silvery white, with dusky scales on the sides above; the hairs on the head are rather golden than silvery.

Length, ·35–·45 inch. The ♂ a little larger, but otherwise not different (except in wanting the ovipositor) from ♀.

Common in Salem, about houses, on the windows and doors of the Museum (Putnam and Packard). Providence, R. I., and New Haven, Conn., in chambers (J. H. Emerton). Knoxville, Tenn. (Dr. J. Curtis). March–October.

Lepisma domestica, n. sp. Body broad, pearly white, covered densely with scales, and mottled with dark spots with silky white hairs. A dense fringe of long hairs at base of head, extending around in front of the eyes and grouped in two tufts; vertex bare. The three thoracic segments are mottled with dark scales, the third being darkest. Basal abdominal segments mottled like the thoracic ones, while a few dark scales are scattered over the remaining segments except the terminal one. On each side of all the segments behind the head is a subdorsal row of corneous tubercles, each supporting a pencil of 6–8 radiating hairs; a similar row of thicker tubercles on the side of the body. Around edge of thoracic segments a fringe of hairs, arising from short lines directed inwards at right angles to the edge of the segment, there being seven on the mesothoracic, and three on prothoracic ring; on metathoracic ring six lines on a side. Antennæ and median caudal stylet nearly as long as the body.

The maxillary palpi, six-jointed, long and slender, are held out at an angle of 45°, the two terminal joints resting on the ground like the tarsi, and during the movements of the animal they seem to be of use in supporting the body. Labial palpi three-jointed, basal joint long and cylindrical. Second joint a little shorter, clavate; third about as long as second, broad, subtriangular, truncated at tip, two-thirds as wide as long. Telson very short, broadly triangular, blunt. The two lateral caudal stylets about twenty-jointed, the joints increasing in length towards tip, verticillate with from three to four hairs, and ringed with a paler hue at joints. Sterna large and triangular, heavily fringed, prothoracic one considerably longer than broad. Numerous specimens.

Length, ·50 inch.

Common in houses about hearths and fire-places, in warm and dry situations, eating sugar, etc. Salem (Packard).

Lepisma spinulata, n. sp. 5 ♀. Body rather broader and shorter than *L. domestica;* very hairy, head tufted with long hairs, and sterna fringed with stiff hairs, while the caudal appendages are spinulated instead of villose, being provided with long, stiff spinules, which at intervals stand out at right angles. Antennæ not longer than the body. Maxillary palpi five-jointed, shorter than in *L. mucronata*, but structurally as in that species, the joints being rather short and stout and hairy. Labial palpi much shorter than in *L. domestica* or *mucronata.* Caudal stylets much as in the two species above named, but scarcely as long as the body, annulated with light and dark rings. Body darker than *L. domestica*, the dark scales not arranged in bands. Two rows of minute pencils of hairs along each side of abdomen above. The lateral row of tufts along under side very conspicuous. Abdomen unusually broad; telson triangular, acute, longer than broad, hairy.

Length of body (excluding appendages), ·35 inch.

Waco, Texas (Belfrage).

This species differs from all the foregoing by the acutely triangular telson.

Lepisma mucronata, n. sp. 1 ♀. This species closely resembles *L. domestica*, but differs in the large, long, acutely triangular telson, and in the more hairy body, while the caudal appendages are much more villose. Proportionate length of antennæ and caudal appendages the same as in *L. domestica.* Maxillary palpi shorter, more hairy, joints much stouter, less swollen at tips, five-jointed. Terminal joint of labial palpi more acute. Body rather stouter, but with the same color and style of markings as in *L. domestica*, but eyes slightly smaller.

Length, ·50 inch.

Pulvon, West Coast of Nicaragua (J. M'Niel). This fine species differs from *L. spinulata*, its nearest ally, by the longer antennæ, palpi and caudal stylets; the longer, narrower abdomen, and in having the hairs on the caudal appendages long and fine, villose instead of stiff, and by the more acute telson.

Machilis brevicornis, n. sp., 1 ♂ 5 ♀. Antennæ small and short, not reaching end of body; second joint small. Palpi shorter and proportionally thicker; feet shorter and smaller than in *M. variabilis.* The hour-glass area under the eyes much larger, the end towards middle of head much larger, and not so highly colored as in *M. variabilis.* Abdominal appendages smaller than in *M. variabilis.* Caudal appendages with pale rings, much the same in both species. Maxillary palpi dull coffee brown, with light, short rings. As my specimens are rubbed, having been preserved in glycerine, it would only be safe to describe the species as dull brown, without the decided reddish tinge of *M. variabilis*, but as the two species differ so much structurally, they can readily be discriminated.

Length of body (exclusive of appendages), ·30–·35 inch.
Waco, Texas (G. W. Belfrage).

Machilis orbitalis, n. sp. This species differs from *M. variabilis* in the shorter antennæ, which are shorter than the body. It is in this and other characters closely allied to *M. brevicornis*. It may at once be distinguished from that species by the peculiar white orbits, while those of *brevicornis* are dark; also by the slenderer maxillary palpi, which are seven-jointed. The fifth and sixth joints are much longer and slenderer in proportion than in *brevicornis;* the seventh is very small, being a little over half as long as the sixth, while in *brevicornis* the last joint is large and about as long as the penultimate. The hairs are finer and shorter than in *M. brevicornis*. The proportions of the body and caudal appendages are much as in *M. brevicornis*, but unfortunately the scales and abdominal appendages have been rubbed off, so that this description must be provisional and imperfect as regards these parts. In alcohol the tegument is reddish.

Length, ·30 inch. 10♂ and ♀.

Idaho Terr., west side of Teton Range, Aug. 4, 1872; Teton Cañon, Aug. 1, 1872 (Hayden's U. S. Geol. Survey, Dr. J. Curtis).

Machilis variabilis Say, Jour. Acad. Nat. Sci., ii, 12 (1821).

♂ ♀. Antennæ very long, hairy, extending as far as the end of the longest caudal stylet; second joint rather long and large; two basal joints white at tip. Maxillary palpi unusually long and rather slender; three basal joints white at tip; third joint with a reddish tinge. Legs of the usual proportions, reddish with pale annulations. Spines at base of two posterior pairs as usual in the genus. Abdominal appendages longer and larger than usual. Ovipositor large and very long, reaching nearly to middle of the shorter caudal stylets. Eyes shining greenish; a narrow brilliant coppery hour-glass shaped area under the eyes. Caudal stylets as usual in the genus; a lilac tinge at base, terminal half pale ash. Body ash brown, varying much in hue.

Length, ·35–·40 inch, exclusive of caudal stylets.

Danvers, Mass., under stones, July 25 (J. H. Emerton). Thirty specimens from Knoxville, Tenn. (Dr. J. Curtis and Dr. S. M. Burnett). Indianapolis, Ind., under rotten logs, Aug. 20 (J. H. Emerton).

Besides the presence of an ovipositor, the ♀ differs from ♂ in the second (or largest) joint of antennæ being much smaller.

It differs from an Italian species collected by myself on the Borromeo Islands, Lake Maggiore, in the longer antennæ and palpi, while the ovipositor is twice as long and large, and the antennæ are much longer than in this or *M. polypoda* which I found in abundance in the ruins of Dolbardarn Castle, North Wales.

Machilis cavernicola Packard, Amer. Nat., v, 747 (1871). Triura cavernicola Tellkampf, Archiv für Naturgeschichte, x, Bd. 1, 321. This species, which inhabits Mammoth Cave, is described as being white.

DESCRIPTIONS OF NEW AMERICAN PHALÆNIDÆ.

BY A. S. PACKARD, JR.

I have thought it best to draw attention again to this family of moths, to enable collectors to determine some of our common species heretofore undescribed. It is hoped also that more attention will be paid by entomologists to this beautiful group of moths, as I am anxious to issue as soon as possible a monographic account of them. I shall be happy to name specimens, and will, if desired, carefully return them. It should be remembered that they abound most in June and early in July.

The names of persons to whom I am indebted for the loan or contribution of many of the specimens here described are duly credited in the descriptions. The types are mostly contained in the Museum of the Peabody Academy of Science.

Carsia alpinata, n. sp. ♀. Ferruginous ashen slate color; front reddish. On the fore wings a basal oblique linear cross line; a middle broad line, regular, and angulated distinctly just below the costa, below which the line is double. Discal dot small but distinct. Outer line narrow, doubly curved and finely zigzag, on the outer side twice dilating, and finely toothed, opposite which are two rusty red spots, interrupted by two faint lines. Without, a darker line proceeds from the middle of the wing obliquely towards the apex. Fringe long, spotted conspicuously with white. Hind wings plain, slate colored, with no marks. Beneath, the fore wings are slate colored, becoming rusty red towards the costa and outer edge; hind wings dull reddish beneath, with a slight purplish tinge, and an extradiscal dark line more distinctly marked than in the other species. Fringe not so distinctly spotted with white as on the fore wings.

Length of body, ·35; length of fore wing, ·50 inch.

Taken half way between the Summit and the "Ledge," Mt. Washington, Aug. 18 (Shurtleff).

Readily known by the red under side, the broad reddish band, the outer waved finely dentate band, and the two ferruginous spots, opposite each bend of the line.

Carsia boreata, n. sp. ♂. Front and palpi blackish, with white scales; thorax dark, with light scales. Fore wings of a peculiar ash color, dark on the outer edge and on the base of the costa. A narrow band just beyond the basal third of the wing, narrower and less angulated than in the other species, being curved, and just below the costa slightly angulated; on the costa and inner side it is single, in the middle double, being within paler, dark brown. A similarly colored parallel band, but more irregular, externally in the middle of the wing broadly tridentate, the lower tooth rounded and set in, as the line contracts; it is paler in the middle of the wing, darker on the edges. A submarginal, parallel, diffuse band, widening on the apical half, interrupted opposite the middle and more prominent tooth of the middle line, by a geminate, rather indistinct rusty spot, which is not so distinct as in the other species. Fringe long, dusky, checkered with white opposite the ends of the venules. Wings more thickly scaled than usual and venules not so prominent. Hind wings dark slate color; fringe spotted with white. Fore wings beneath nearly concolorous with the upper side of the hinder pair; a slight ferruginous tinge towards the costa. Hind wings much paler, cinereous, with reddish scales. An outer line goes from the costa towards the middle of the wing.

Length of body, ·48; of fore wing, ·55 inch.

Base of Mt. Washington, N. H. (Shurtleff); Tuckerman's Ravine, Mt. Washington (Sanborn).

This species may be known by its dark slate color, without any rust red tinge on the fore wings above, and less beneath than in *C. alpinata;* also by the large teeth of the outer band, and the narrower inner band.

Cidaria disjunctaria, n. sp. ♂. Front and palpi ashen, with whitish scales, palpi very long and bushy, hairs at tip being unusually long and spreading; at base of fore wings two parallel dark slightly curved dentate lines, growing paler and diffuse within; followed by a pale whitish space, with two faint diffuse lines, a broad mesial blackish very distinct band, dentate, teeth rounded, especially externally, broadest on the costa, on the inner margin disconnected, a large squarish black spot on edge; succeeded in the submesial space by an isolated (transversely) oval lanceolate spot; in front of this the band is connected. A submarginal row of very acutely triangular zigzag white lines, of which three very acute teeth are especially marked towards the costa, on which the line fades away. A long oblique apical dark band, diffuse beneath, but above edged distinctly with white. Fringe black at base, dark cinereous. Hind wings pale ashen, with a single dark waved line. Beneath, the discal dots are very distinct; costa edged with dark scales; an extradiscal line; the row of triangular marks present, and an apical line, though indistinct. Hind wings the same, without apical line. Abdomen with a pale mesial line both above and beneath, also on each side an indistinct row of dots.

Length of body, ·55; length of fore wing, ·65 inch.

White Mts., N. H. (Shurtleff).

Known by the oblique blackish band, disconnected with inner margin, the broad subbasal pale space, zigzag on the sides, and the rather fine acute zigzag line on the submargin. It is closely allied to *C. prunata* Hübn. of Europe.

Cidaria triangulata, n. sp. Of rather large size, and of a peculiar deep russet brown with a rusty tinge; a submarginal row of white lunate triangles ocellated with brown dots. Palpi large, stout, bushy, tip not acute, russet brown. Front and thorax brown. Fore wings russet, with a rusty tinge; base brownish russet beyond a broad pale zigzag band, with luteous scales on the veins, especially on the costa, and on the internal vein the band is broadly indented on the inner side in the median space. Beyond, a broad russet dark brown band of unusual width, blackish on each side, its inner edge sinuate dentate, its outer with three large mesial triangular teeth, thence going nearly straight to the costa, with a broad abruptly acute mesial tooth; a dark indistinct discal dot. On the costa are luteous scales, as also a diffuse luteous area below the first median vein, with dark ringlets. A submarginal row of acutely triangular white spots enclosing linear lunate brown spots, which become acutely triangular towards the costa. From the third spot from the costa proceeds a once-angulated line to the apex, below which the margin is unusually dark. Fringe with ochreous scales externally, and two rows of dark acutely zigzag lines, bordered externally with white; fringe dark brown. Beneath, the discal dots very distinct, costa ochreous, an outer dark line which becomes obsolete towards the inner edge; an apical dark patch. Hind wings dusted thickly with brown scales, veinlets ochreous, fringe dusky, spotted with brown, and a brown spot on inner edge between the end of the fringe and line.

Length of body, ?; length of fore wing, ·70 inch.

White Mts. (Sanborn) (Grote.)

The unusual brown specks beneath on the hind wings, and brown spot on the inner angle of hind wings, and the brown ochreous rusty wings, besides the row of triangles of white, enclosing lunules and triangles of brown will readily distinguish it.

Cidaria albolineata, n. sp. ♀. Front pale luteous; palpi pale above and at tip, blackish on the sides; head beneath luteous. Fore wings black, with a subbasal broad whitish band angulated on the median vein, and with smaller, very acutely produced angles on the veins; on each side, in the middle, the sides formed of white lines, are intervenular dark patches. A broad mesial black band, narrowing towards the inner edge, lined externally with white. Discal dot very black. From the first median interspace to the costa the outer line goes straight, with a slight sinus on the costa; below, it consists of three intervenular rounded lobes, that in the middle of the wing are larger. Beyond, on a luteous, or pale ochreous ground, is a row of acutely triangular black spots, the one below the second median venule being acutely elongated, lunate. A zigzag white line goes to the costa, marking a marginal subapical black triangular space. Fringe long and blackish, interrupted with white. Hind wings pale cinereous, a little dusky on basal two-thirds; discal dot distinct. Beneath, margin of wings paler, marked off by a quite distinct dark line; near the apex on costa three narrow black parallel longitudinal spots. Legs dusky cinereous, ringed with whitish.

Length of body, ·35; length of fore wing, ·45 inch.

White Mts., Aug. 23 (Shurtleff); Maine (Packard).

Very distinct, and easily known by the black middle of the wing lined with white, and by the black triangular patch just below the apex on the outer margin, while the margin of the wing is luteous, interrupted with acutely triangular black spots, and the head, tip and upper side of palpi are also luteous.

Cidaria montanata, n. sp. ♀. Fore wings with the apex unusually acute; hind wings produced towards the apex more than usual. Head much as in *D. russata*, but clypeus more hairy in front, palpi a little longer, second joint more bushy, the third joint longer and slenderer, palpi extending farther beyond the head than usual. Dark ashy brown. On fore wings a basal, regularly curved fine line. Beyond, a broad curved band, whitish, zigzag, finely and acutely bordered externally with black, duller in the middle. The middle of the wing is occupied by a very broad dark brown band, which is finely zigzag on the inner side, there being black points on the veins; externally there are two large unequal acute triangular teeth in the middle of the wing; in front of the larger is a slight sinus, and thence the band goes straight to the costa. Beyond is a submarginal band of very acute black points, bordered by a still more acute white dentate line, from which a white, once zigzag line goes to the unusually acute apex. Fringe dark, interrupted slightly with dusky at the ends of the venules. Hind wings with two submarginal acutely dentate pale lines; edge dusky, fringe dusky, concolorous with that of the fore wings. Beneath dusky. Discal dots distinct; outer side of broad mesial band represented by a costal curve, and a broad mesial slightly scalloped curve, a submarginal row of dusky patches; edge of wing and apex dusky.

Length of body, ·44; length of fore wing, ·60 inch.

Grand Gulf, Mt. Washington, N. H., Aug. 25 (Shurtleff).

This peculiar species may be recognized by its very acute fore wings, the very broad mesial dark band, with the two large outer teeth, the double submesial band acutely dentate, and the narrow, once zigzag, apical oblique line.

Cidaria (Thera) *contractata*, n. sp. Palpi, head and thorax, as well as wings, pale cinereous; base of fore wing with scattered black scales, and two curved black lines, the outer heaviest and marked with longitudinal stripes on the veinlets; beyond, a broad pale band of very uniform width, angulated slightly on the median vein. Beyond, a mesial band, margined with black, narrowing more than usual on inner margin, where it is less than one-third as broad as on costa, and the two black margins meet, forming two contiguous black patches. In front the band encloses obscure ringlets of cinereous; the sides are more broadly dark on the costa; discal dot black. Beyond, an obscure pale patch; margin with a zigzag white line, the acute scallops enclosing dark dots; edge of both with the usual black dots and fringe concolorous with rest of wing, and hind wing uniform pale cinereous, with two dusky lines. Beneath, dusky on basal two-thirds; discal dots distinct, outer one-third luteous; pale with the pale zigzag line on costal half, and on hind wing two dusky lines distinct.

Length of body, ·40; length of fore wing, ·45 inch.

Maine (Packard).

Easily known by the narrow dark mesial band, black and very narrow on inner edge, and the pale zigzag line reappearing beneath. Also, on fore wing a black streak near apex, and a smaller apical black dot. It is closely related to the European *Cidaria* (Thera) *juniperata*.

Lobophora viridata, n. sp. One ♀. Head greenish, with ashen and blackish scales. Palpi of great length, porrect, large and stout, black, with a few light cinereous scales, at extreme tip whitish. Fore wings diffusely greenish along the costa, median vein and inner margin with black strigæ and scales; a broad basal black curved line, dentate on internal vein and widening on the costa. Beyond, a broad greenish band with several rows of black longitudinal strigæ; a broad mesial dark band, one-half as wide on internal edge as on costa, dusky with black scales and streaks, and on outer edge enclosing at base of first median space a green patch, also a broad longitudinal apical patch; outer edge dark cinereous. Fringe pale. Hind wings pale, immaculate; beneath uniformly pale, with a dusky line common to both wings, and a slight discal dot. On the base of the inner edge of hind wing is a long blister-like expansion of the wing by which this genus may readily be recognized, besides its long slender wings with apex much produced, and the very large long palpi. Antennæ simple, annulated also with white. Legs dark, ringed with white. The hind wings extend nearly a third of their length beyond the end of abdomen.

Length of body, ·34; length of fore wing, ·44 inch.

Brunswick, Me. (Packard).

This species is readily known by its wings being green along costal edge and at base.

Eupithecia vernata, n. sp. ♂ and ♀. This fine species is three times as large as usual; the front of the head is fuller, broader, the median veinlets are shorter, and the interspaces broader than in *E. miserulata* and allies. Palpi white beneath, second joint black, third white. Pale whitish cinereous, basal half of fore wings nearly white, with a black linear basal line curved and angulated outwards strongly on the median space and sinuated inwards on the submedian interspace; a black small lunate dot; a few brownish and yellowish scales in the middle of the wing; veins irregularly spotted with white and black. An outer broadly sinuate line, very regularly incurved below the median vein, and in front of that going nearly straight to the costa, and touching the hind end of the discal spot; from this line proceed linear black streaks along the veins, especially marked on the median branches, which become interrupted towards the outer edge. The line is broadly and diffusely shaded with pale brown externally. Beyond is a geminate curved line of brown scales, partially obsolete below the median vein, and especially marked on the costa and in the extradiscal space. A marginal row of geminate white, with no markings. Beneath pale white; the fore wing with the outer curved line faintly marked, and a little beyond intervenular black dots. Fringe pale whitish. Hind wings dusky. Fore legs dark, ringed with white.

Length of body, ·45; length of fore wing, ·60 inch.

Brookline, Mass., April 28–May 29 (Shurtleff); Maine (Packard); New York (Grote).

One of the earliest insects that flies, appearing in April before the snow is off. It is easily known by its large size, its white wings with the distinct linear black sinuate line, the outer shaded diffusely with light brown, and by the white and black spots and streaks on the veins and their branches.

Eupithecia geminata, n. sp. ♂ and ♀. Wings well rounded; palpi large and stout. Body and wings uniformly rather pale cinereous, wings very free from the usual lines; four costal dots, the outer one forming a large dark triangle, the third an oblique line connecting with the discal dot, which is large and very distinct, black. An inner one of a few minute black fine dots; an outer smaller one with a curved abbreviated cinereous line in an obscure line including the discal dot. A fine wavy scalloped submarginal pale line. Edge of wing with very narrow black intervenular lines; fringe pale dusky cinereous like the wings: with black spots on the base of fringe on the ends of the veinlets; a quite distinct geminate white dot on the inner angle of the fore wings. Hind wings with wavy acute zigzag pale and cinereous lines on the outer edge; discal dot distinct; edge and fringe otherwise as in fore wings. Beneath, these markings are repeated, with the addition of quite a distinct submarginal dusky line common to both wings.

Length of body, ·30–·34; length of fore wing, ·38–·50 inch.

July 24, Maine (Packard); Mass. (Sanborn).

Easily known by two dots on inner angle, and large triangular costal dot.

In the female the wings are more acute and larger, and the fringe shorter than in ♂.

Eupithecia palpata, n. sp. Two ♂, one ♀. Fore wings long, pointed. Palpi unusually large and stout, broad at base, acute, extending out farther than the width of the head; dark gray with light scales, tips luteous. Head dark gray; front edge black. Fore wings crossed by three blackish lines, very regularly curved and parallel to each other, represented on the hind edge by a black dot on the costa, the wing in the middle and along the hind edge somewhat luteous, with black speckles and strigæ on the veins; a submarginal row of white dots, shaded within with black, ending in the usual geminate white dot; edge of wing black. Fringe very long luteous cinereous, interrupted by broad dark square patches at the end of the veins. Hind wings with four obscure dark lines, the second enclosing discal dot; discal dot black, distinct, edge black. Fringe as on fore wings. Abdomen cinereous, with black scales, a black line on each side, tip squarely truncated, though longer than broad, with long straight blackish scales. Beneath pale ashen with the two outer black lines, and on hind wing four dark lines; fringe with smaller dusky spots than above. Abdomen pale beneath. Legs pale, uniform with body and wings.

Length of body, ·35–·38; fore wing, ·40–·43 inch.

West Farms, New York (Angus); Brunswick, Me. (Packard); Albany, N. Y. (Lintner).

Readily recognized, as it differs in the large stout acute black palpi, the four regularly curved parallel black lines on both wings, seen more distinctly beneath, and the black line on each side of abdomen.

Eupithecia interrupto-fasciata, n. sp. Three ♂, two ♀. Head and body cinereous; anterior edge of front with blackish scales along the orbits. Palpi scarcely so large as in *E. geminata*. Whitish above, dark on the side. Antennæ finely ciliated beneath, above minutely annulated with black. Thorax cinereous, uniformly concolorous with the wings. Fore wings uniformly cinereous, with no very distinct lines or bands, but on the outer third beyond the discal spot brownish between the veinlets. No line at base. Veinlets dotted with black scales; on the costa three dark indistinct spots within and two beyond the discal spot, the two outer ones being the largest. Discal dot large, distinct, black, beyond is a broad transverse area, where the veinlets are dotted more thickly with black scales than elsewhere, bounded beyond by a wavy doubled elbowed line extending from costa to median vein; submarginal whitish line very narrow, more zigzag and linear than usual. A geminate white dot on internal angle, very distinct, forming a V; the lower dot much smaller than the upper. Fringe long, cinereous, interrupted with dusky on the end of the veinlets. Hind wings with a round small but distinct discal dot; an indistinct submarginal band; five dark bands on the inner edge which do not pass beyond the median vein. Margin of wings uniformly dusky, without any light or dark scales. On second ring of abdomen a broad black band, interrupted by a pale mesial white narrow band, which extends along six rings, with a mesial black dot on each ring; sides of abdomen with brownish scales; extreme tip pale luteous. Margin of both wings black; fringe as in fore wings. Beneath, clear cinereous with no brown scales; the broad costal dark bands enclosing two much smaller bands, a short line half-way between discal dot and outer edge of wing. Margin of both wings dusky, containing a white hair line. Fringe paler than margin of wing. Hind wings with five dusky lines, two within the discal dot (sometimes wanting), the third including the dot, very narrow, the two outer ones broader, especially the submarginal one, which reaches to the edge.

Length of body, ·20; length of fore wing, ·30 inch.

Mass. (Sanborn); Albany, N. Y. (Lintner); Texas, Oct., Nov. (Belfrage).

Differs from *E. Strattonata*, to which it is rather closely allied by the wings being more cinereous, and beneath with no brown scales at all; by the geminate white V-shaped spot on inner angle, and the five lines on the under side of hind wings, which only appear on the inner edge above; by the interrupted black band on second abdominal ring and the white line on six rings, each ring clouded by a black dot, and by the very pale luteous straight converging hairs of the extremity.

In two females from Texas the markings are more distinct than above described, and there is an obscure submarginal row of white dots on the hind wings. From *E. geminata* it differs in the longer wings, and the presence of lines in the middle of the fore wings, while the discal dots are smaller.

Eupithecia Strattonata, n. sp. ♀. Fore wings very acutely produced, outer margin very oblique; head and palpi dark cinereous; palpi acute, extreme tip pale; thorax covered with brownish scales; abdomen banded with pale ashen; the broadest band on the basal joint; fore wings with brownish ochreous scales, costal margin clear cinereous, with five blackish spots; the one just before the discal dot largest, square; middle and outer margin of the wing brownish, a submarginal pale obscure line, a few black strigæ and dots on the median and internal veins on basal half of the wing, and a short row of black venular dots just beyond the discal dot, which is very distinct, on a cinereous ground. Margin of wing black; fringe long, dusky, with intervenular black linear spots. Hind wings cinereous, with black speckles at base, outer third brownish; a short wavy whitish geminate line becoming obsolete towards the middle of the wing, with a single pale dot on the inner angle; no discal dot. Beneath brownish, especially externally; discal dot very distinct, small on hind wings, an extradiscal narrow band, and a marginal broad brown band common to both wings.

Length of body ·28; length of fore wing, ·38 inch.

Natick, Mass., July 17 (Stratton).

Easily known by the brown wings, an outer pale curved line, including black dots; by the costa being paler, with five black spots, and by the want of the usual zigzag waved pale and dark lines. (Near *E. coagulata* Guen. from Pennsylvania.)

Scotosia albosignata, n. sp. Four ♂, two ♀. In this species the fore wings are entire, the hinder pair but slightly scalloped, being rather finely dentate. Compared with *S. undulata* the wings are much smaller, the body rather larger, and the hind wings more deeply and acutely dentate. Body and wings dark wood-brown, the wings covered by fine dark irregularly scalloped lines, forming dark venular points. Fore wings with an indistinct basal whitish line angulated on the costa, a similar one beyond waved between the venules; and an outer white irregular scalloped line, there being two grand scallops projecting outwards in the first and second median cells. A submarginal obscure half-effaced zigzag line; three rows of white venular points (often obsolete) between these last two lines. A marginal row of white dots between the end of the venules and the hind wings at the bottom of each scallop. Fringe dark brown. Under side pale gray, dusted, and with five or six wavy blackish obscure lines, with dusky scales between, the outer submarginal line forming a broad blackish shade on the fore wings, mingled with the broad blackish border; also a submarginal row of whitish points on both wings.

Length of body, ♂ ·52; ♀ ·45; fore wings, ♂ ·60; ♀ ·62 inch.

North Carolina (Dr. Kneeland, Mus. Bost. Soc. N. H.); Georgia and Alabama (Grote); Texas, July, Sept. and Oct. (Belfrage).

Readily known by the dark brown color and the unusually blackish lines and border of the wings beneath. The fore wings are much as in *S. Californiata* Pack., but the hind wings are much less deeply scalloped.

Pachycnemia psi, n. sp. Palpi very long, upcurved, antennæ ciliated, long and slender. ♂ pale cinereous with smoky scales, prothorax paler with a white oblique line beginning at the base of the costal edge of the wing, and extended outwards and downwards along the internal venule; this white streak is margined above with a dark brown streak, which is continued beyond the white streak to the inner margin, thus forming the basal line. Another basal curved line passing outward crossing the outer oblique line, thus enclosing a triangular space on the internal angle. An indistinct brownish linear discal streak. On the outer fourth a twice curved line margined externally with white, on the costal half of the wing becoming a regular curved line, a semicircle which is dark brown, and which with a straight concolorous streak touching its centre forms a Greek *Ψ*, except that the line does not go beyond the bow. There is a supplementary apical, oblique dark streak. Hind wings with pale red lines concolorous with the abdomen. Beneath uniform pale cinereous; tail upcurved, becoming darker towards the tip.

Length of body, ·43; length of fore wing, ·55 inch.

Brookline, July 7, (C. A. Shurtleff) Cambridge, Mass.

Easily known by the white stripe at base of wing and the Ψ-shaped mark at apex.

Aspilates pervaria, n. sp. Six ♂, five ♀. Smaller than *A. dissimilaria* Hübn.; antennæ broadly pectinated, but the branches not inclined to be caught together, being stiffer; palpi one-half smaller. Fore wings less pointed at apex; hind wings not extending beyond tip of abdomen, while in *A. dissimilaria* they reach a little way beyond. Cream white, with a very slight ochreous tinge. Front of head and palpi brown. Both wings either quite clear or finely speckled, or with heavy large brown specks. A single outer oblique brown line on primaries (sometimes wanting) fading out just before reaching the costa, sometimes the wing beyond the line is shaded with brown. Discal dots dark, distinct on both wings (varying in size on either pair). Beneath much as above; the single line usually reproduced. The discal dots very distinct.

Length of body, ♂ ·50–·57, ♀ ·50; of fore wing, ♂ ·60–·70, ♀ ·56–·60 inch.

Texas, May 21–23; Oct. 3–Nov. 11 (Belfrage). This very variable species may be recognized by its whitish speckled wings, with the single outer brown line on primaries, and the edge beyond sometimes tinged with brown; also by the presence of dark discal dots. It is quite nearly allied to the European *Aspilates gilvaria.*

Aspilates 4-fasciaria, n. sp. One ♂. About the size of and allied structurally to *A. gilvaria* of Europe, but differing much in the marking, it is rather smaller than *A. pervaria;* compared with the latter, the antennæ are not so widely pectinated; the fore wings are of much the same shape, but the costa is much more convex, while the outer edge is less so; and the hind wings are not so fully rounded. Body and wings uniformly pale yellow ochreous, fringe concolorous. Fore wings crossed by four faint darker bands, straight, parallel, the second in the middle of the wing the widest; the two outer ones nearer together than either of the others, the fourth band not reaching the apex, and narrower than the others. On the hind wings three similar bands. Beneath as above, with the lines reproduced and not much less distinct than above.

Length of body, ♂ ·46; fore wing, ♂ ·57 inch.

Kansas (Glover, from U. S. Agricultural Department).

This species differs so much from any others we have that its pale ochreous color without any dark specks above or below, and the four slightly oblique parallel bands will enable one easily to determine it.

Macaria S-signata, n. sp. Six ♂, four ♀. This species belongs to the same section of the genus as the species described by Walker, (Can. Nat. & Geol.) under the name of *Anaitis Orillata;* the outer edge of the fore wings not being excavated, and hind wing not angulated; with *Orillata* it differs from all the other species known to me by the dark clear line crossing the outer third of both pairs of wings. Body and wings tawny ash, head a little darker than the body; front of head, palpi and antennæ tawny yellow. Fore wings densely speckled with brown, with four prominent brown spots on costa; the two inner being the termini of an indistinct row of venular dark dots, the second including the discal dot. The third line represented by a distinct S-shaped wavy black line, sometimes but not usually reaching the costal dot. Beyond is a broad dark shade running across the wing. Half way between the sinuate line and the edge of the wing is a white interrupted line. The usual black points on the edge of the wing. Hind wings (usually) with a single sinuate distinct brown line crossing the wing; beyond, a broad brown shade, succeeded by an irregular whitish line often obsolete. Beneath with an ochreous tinge; densely speckled; the line faintly reproduced. Submarginal broad band distinct; discal dot, on hind wing large; on fore wing it is indistinct.

Length of body, ♂ ·43, ♀ ·50; fore wing, ♂ ·45, ♀ ·55 inch.

Texas, Aug. 1-Sept. 30 (Belfrage).

Differs from any other species known to me by the conspicuous S-shaped line in outer third of fore wing.

Macaria puncto-lineata, n. sp. One ♀. This species in its tawny ash color, the shape of the wings and the color of the under side, is nearer to *M. S-signata* than any species known to me. It differs in the hind wings being a little angular, while the outer sinuate line is represented by a row of black dots. Body and wings tawny ash; head, palpi and antennæ tawny yellow. Three obscure dusky tawny bands cross the fore wings, enclosing a row of black dots, those in the outer line being most marked. The marginal row of black dots as usual. The same marking on hind wings; the outer dusky band a little wider than on fore wings. Beneath as above but with a decided ochreous tinge; a common inner and outer band, the inner ochreous, the outer blackish brown, consisting of two broad obscurely scalloped lines; the wing beyond washed with dull deep ochreous. Discal dots more distinct than above; those on fore wings brown ochreous, on hind wings clearer, blackish.

Length of body, ·40; of fore wing, ·52 inch.

Texas, Sept. 23d (Belfrage).

Easily recognized by the fore wings not being excavated; by the tawny color, the three rows of black dots on primaries, and by the unusually dark distinct broad outer band on the under side of the wings.

Macaria pallidata, n. sp. Three ♂, two ♀. A pale cinereous species, with the outer edge of fore wings straight, not excavated, the hind wings rounded not angulated. Head and palpi pale, concolorous with the body. Fore wings crossed by three rows of venular dark dots, ending in three costal larger spots, the outer row angulated just below the costa; the fourth spot beyond (usually present) wanting. A faint diffuse brownish shade beyond the outer row of dots (often wanting). Both wings speckled slightly with brown. Discal dots on both wings, brown. The usual marginal row of dots. Fringe concolorous with the wings. A faint dusky diffuse band near the edge of hind wings. Beneath the wings are heavily speckled with pale brown; costa and veins ochreous; discal dots larger and distincter than above; the outer line usually reproduced and double. A submarginal broad diffuse shade often present on hind wings.

Length of body, ♂ 41, ♀ ·40; fore wings, ♂ ·47, ♀ ·50 inch.

Texas, April 30–May 23d, Sept. 15 (Belfrage).

Four of these specimens are whitish, a single ♀ much darker and with the submarginal band present on hind wings, which is wanting in the other species; I am disposed to regard it as a simple variety. The species may be identified by the non-excavated fore wings, the simplicity of the markings; by the hind wings being rounded, and also by the head not being darker than the rest of the body, as usual in the genus.

Macaria multilineata, n. sp. One ♂. This species, in its narrow primaries and well angled secondaries, is allied to the more typical species of the genus, but differs in the antennæ being subpectinated, the branches being short slender tubercles ending in a tuft of hairs. Body and wings whitish ash; the head, palpi and antennæ, tawny yellow. Fore wings crossed by a greater number of brown lines than usual; an inner very distinct line, sharply angled on the costa; a median faint double line ending in a single darker brown costal spot; an outer dark distinct oblique line, a little curved outwards just below the costa, and swelled out suddenly on the median vein; a fainter line on each side, and externally a broad pale brown shade becoming more distinct towards the costa. Still beyond a whitish submarginal line widening triangularly on the apex. The marginal dark brown line very distinct, scarcely interrupted. Hind wings with a distinct black discal dot, a line within; and beyond, a broad brown shade, bounded on each side by a darker brown line. Both wings densely speckled. Beneath marked much as above, the four lines quite distinct, the third forming a band composed of three parallel brown slightly wavy lines. Four distinct brown lines on hind wings.

Length of body, ♂ (abdomen wanting); fore wings, ·55 inch.

Mass. (Sanborn).

This pretty species differs from all the others in the distinct numerous brown lines and the subpectinated antennæ.

Macaria duplicata, n. sp. Three ♂, three ♀. This species approaches the typical species of the genus, in having the fore wings faintly excavated below the apex, and the hind wings distinctly angulated. In its markings and in the head being concolorous with the body, it approaches the Texan *M. pallidata*. Pale ash on body and wings, the latter more or less dusted with darker scales. Fore wings crossed by three broad dusky bands, enclosing dark venular dots, those in the outer band being conspicuous; this outer band is usually (not always) doubled, the inner ending on the third costal spot, the outer more diffuse and ending in a fourth broader costal spot (this spot is sometimes large and diffuse, sometimes smaller than the third and quite distinct). The marginal row of dots is less interrupted than usual, forming an almost continuous line. Hind wings marked as the anterior pair, with two broad bands, enclosing a row of black spots, the outer band being doubled. Beneath, whitish ash, with thick brown specks, an oval large discal dot on primaries centred with white; an inner line and an outer double line on both wings; the outer portion of the double brown line being wavy and three times as wide as the inner, both wings marked the same, except that the discal dot on hind wings is small and inconspicuous (in one specimen larger and more distinct).

Length of body, ♂ ·42, ♀ ·50 inch.

Maine (Packard); Mass. (Sanborn); West Farms, N. Y. (Angus); Illinois (Clemens); Alabama (Grote).

This species differs from all the other forms by its pale whitish ash color, the head being scarcely darker than the body, by the fore wings being almost straight below the apex, while the hind wings are very slightly angulated; and by the outer double line, so dark and conspicuous on the under side of the wings; and also by the large oval discal ringlet. The single Alabama ♂ is rather smaller than any of my other specimens, with all the markings very distinct.

Macaria minorata, n. sp. One ♂. Smaller than any species known to me; the fore wings slightly excavated below the apex; hind wings angulated a little and slightly scalloped. Body and wings pale pearly ash, head, prothorax, palpi and antennæ, tawny red. Fore wings crossed by three distinct wavy brown lines, ending in three well marked long oblique costal spots, the lines being angulated outwards below the costa. A broad submarginal diffuse tawny rust-red shade, most distinct on the costa. A distinct dark brown marginal line. Hind wings crossed by three distinct brown lines, of which the middle is the better marked, being much curved and wavy. Beneath paler, no rusty tawny on fore wings, and only one line well marked just before the middle of the wing. The three lines present on hind wings, and a faint discal dot.

Length of body, ♂ ·37; fore wing, ♂ ·42 inch.

Natick, Mass., June 16 (Stratton).

This is our smallest species, and somewhat resembles our common *M.* 4-*signata* Walk., having four costal spots, of which the fourth is large, rust tawny, while the body and wings are of much the same color. The hind wings, however, are much less angular and the lines more distinct, while the moth is very much smaller than usual.

EUMACARIA, nov. gen.

Front rather narrow; scales rather long, closely appressed to the surface. Palpi long, narrow, ascending; a third of second joint surpassing the front; third joint minute, pointed. Antennæ broadly pectinated; in ♀ subpectinated, serrate. Thorax rather stout. Primaries: costa a little convex; apex a little produced, obtuse. Lightly subfurcate; outer margin not so oblique as in *Macaria*, hardly excavated below the apex, rather convex in the middle. Costal vein simple. First s. c. absent; second sends out two branches near its base; the lower one very long, free from its nervure. Third and fourth have a common origin; the third divides much beyond its middle. Secondaries with the internal angle rectangular, even with the tip of abdomen. Apex much rounded, middle of outer margin not produced, obtusely slightly angulated; above slightly scalloped. Legs short and feeble, hind tibiæ slender, the two pairs of spurs not remote, slender, pointed, subequal; tarsi nearly as long as the tibiæ. Abdomen very slender, with an anal tuft.

Coloration: cinereous, dusted thickly with brown. An outer obscure line of black spots. Margin dark brown.

In the pectinated antennæ, long slender palpi and short obtusely angulated secondaries, it may be readily distinguished from *Macaria*.

Eumacaria brunneata, n. sp. Four ♂, two ♀. Pearl ash, with chocolate brown markings. Head, palpi and antennæ, chocolate brown. Abdomen with two rows of dorsal spots. Fore wings crossed by three distinct brown lines; inner line with a sharp outward curve just below the costa, and below slightly sinuate. A fainter median line slightly sinuate and not reaching as far as the conspicuous linear discal dot. The outer line is broad, firm, very slightly sinuate; beyond it the wing is chocolate brown, with a row of large brown intervenular spots near the line; beyond, a narrow faint whitish line widening triangularly on the apex. Fringe on both wings chocolate brown. Hind wings marked as fore wings, though there are but two lines. Beneath, the wings pearly whitish, checkered with the same lines as above, and with numerous strigæ, some ochreous tints mixed with the brown; a brown band outside of the third line, becoming ochreous on the hind wings. A marginal brown line, fringe brown near the apex, becoming white behind and on hind wings, and tipped with brown and narrowly marked with brown at the ends of venules.

Length of body, ♂ ·37, ♀ ·35; of fore wings, ♂ ·44–48, ♀ ·46 inch.

Maine, June 9 (Packard); Mass. (Sanborn, Stratton); Albany, N. Y., May 25 (Lintner); Texas, June 3 (Belfrage).

This beautiful species may at once be recognized by the chocolate brown lines and markings, and the checkered under side of the wings, and the two rows of abdominal dots.

Corycia biseriata, n. sp. ♀. Uniformly white. Head white, palpi dark. Fore and middle legs blackish brown beneath. Fore wings with two rows of indistinct smoky spots on the venules; the inner regularly curved, the outer broadly sinuate, situated on the outer quarter of the wing, the inner crossing at the origin of the fourth median venule. Secondaries the same; beneath, the costa slightly tinged with brownish at base. Two discal dots present on each wing; a dot at the origin of each venule.

Length of body, ·30; length of fore wing, ·50 inch.

At once recognized by its uniform pure white color, and the two curved series of smoky faint venular spots.

GONIACIDALIA, nov. gen.

♂ and ♀. This singular genus may at once be recognized by the oblong primaries, the apex being prolonged, while the inner angle is elongated into a blunt rounded aborted tail, making the wing as broad near the base as near the apex, and beyond the "tail" the inner edge is exactly parallel to the costal. The outer edge is short and straight, less oblique than in the narrow-winged species of *Acidalia*. The hind wings are still more grotesque than the primaries, appearing as if crumpled up from not having properly expanded after the moth had left the pupa. They are so deeply notched in the inner part of the outer edge of the wing as to appear bifurcate, sending the inner fork, which is acute, nearly as far as the tip of the abdomen, while the outer half of the wing forms the other fork. The inner edge of the wing is much revolute, and near the base of the inner fork carries a crest of fine inrolled hairs. Head and legs as in *Acidalia*, the antennæ in ♂ slightly ciliated, in ♀ simple. Palpi very short, as in *Acidalia*.

Goniacidalia furciferata, n. sp. Two ♂, one ♀. Brick red; head with front and palpi red, vertex and antennæ dull yellowish. Fore wings reddish, with a broad median yellowish patch, not reaching to the inner edge, and extending to the base of wing, interrupted by a basal reddish line; costa reddish as far as middle of the wing. This yellowish area is centred with the reddish brown discal dot. Outer margin of the wing paler, with a submarginal yellowish zigzag line, not reaching any farther than the basal yellowish patch. Hind wings pale reddish, revolute edge yellowish, including the brush of hairs. Beneath much as above, but paler, the wing beyond the middle being crossed by a broad reddish shade, and yellowish on each side, including the apex. Hind wings with two parallel yellowish lines.

Length of body, ♂ ·23, ♀ ·21; fore wings, ♂ ·28, ♀ ·28 inch.

Texas, Aug. and Sept. (Belfrage).

EUACIDALIA, nov. gen.

Though the head and legs are much as in *Acidalia*, yet the wings are so much elongated, especially the hinder pair, that the species to be described below must form the type of a distinct genus. Head much as in *Acidalia*, the front being wide and flat; palpi short and small; antennæ slightly denticulated and densely ciliated, in ♀ simple. Fore wings long and narrow, much produced towards the apex, outer edge very oblique. Hind wings very long and narrow, oblong, not reaching when expanded the end of the abdomen, with a deep notch in outer edge. Legs as in *Acidalia*.

Euacidalia sericearia, n. sp. Three ♂, one ♀. Uniform glossy ash gray. Vertex of head and antennæ white; front and palpi dark brown. Fore wings with an inner line formed of three dark spots, one on subcostal, one on median and the third on submedian vein, and all situated on inner third of wing, the subcostal spot much larger than the others. An outer straight dark very slightly interrupted line, parallel with the outer edge. Fringe concolorous with the wings, a dark line at base. Hind wings with no markings, concolorous with primaries. No discal dots on either wing. Beneath, as above, with a common dark line, straight on fore, much curved on hind wings. Fringe, especially on hind wings, with six dark spots.

Length of body, ♂ ·30, ♀ ·23; fore wings, ♂ ·35, ♀ ·27 inch.

Texas, May and July (Belfrage).

This interesting form may at once be known by the long wings, the hinder pair being notched, and by the dull silky gray color.

Acidalia peralbata, n. sp. One ♂, five ♀. A small species with wings of the usual form, not being elongated. Head white above, including antennæ; front black brown; palpi white, with a few brownish scales. Body and wings pure white, the latter with a few dark fine specks and four distinct dark discal dots. Fore wings crossed by three wavy sinuate ochreous lines, the first and second a little nearer together than the second and third, the second touching the discal spot; the outer (or third) line is much more wavy than inner two; it reaches nearest to the outer edge of the wing on the second median venule. The marginal black points distinct. Hind wings like the primaries, with two lines, the outer more zigzag than on primaries, the inner running just beyond the discal spot.

Beneath, the discal spots larger than above, the basal line not present, the two outer lines dark brown, the inner the fainter and touching the discal dot, the outer broad, conspicuous. The marginal row of black points present, while the wing is dusted quite thickly with brown scales. Hind wings with a line a little beyond the discal dot, the outer line distinct (sometimes the inner line is wanting on both wings beneath). Fore and middle femora and trochanters brown in front.

Length of body, ♂ ?, ♀ ·35; fore wing, ♂ ·35, ♀ ·35–39 inch.

Texas, May and June (Belfrage).

This pretty species differs from any other white species known to me, by the three yellow ochreous lines, and dark lines beneath and the clear black discal dots, as well as its small size and broad wings and whitish palpi.

Acidalia puncto-fimbriata, n. sp. One ♂, three ♀. Closely allied in structure and shape of wings, to *A. peralbata*, though a rather larger species. Body and wings whitish ochreous, with fine dark specks. Vertex of head and antennæ a little whiter than body; front of head and palpi dark brown. Fore wings crossed by five dull obscure subochreous lines; the inner bent outwards sharply just below the costa; second line broader than the others, nearly touching or passing a little beyond the discal dot; third line fine, but distinct, waved and sinuous, situated half-way between the discal dot and outer edge. Two obscure, somewhat diffuse submarginal lines. Edge of wings with an interrupted dark brown line. A row of black points (about eight) in the fringe. Hind wings marked like fore pair, except there are but four lines. Discal dots black, distinct on each wing. Beneath, the discal dots distinct, black; and one prominent black fine line on both wings, half-way between the discal dots and outer edge.

Length of body, ♂ ·30, ♀ ·30; fore wings, ♂ ·30, ♀ ·40 inch.

Texas, September (Belfrage).

This species is marked by the black points on the fringe of both wings, as well as the five subochreous lines and blackish palpi. The wings of the ♀ are considerably longer than in ♂.

Acidalia longipennata, n. sp. One ♀, four ♂. A species with unusually long wings, the apex of primaries greatly produced, while the hind wings are well rounded. The ♂ antennæ are almost subpectinated, the bristles arising from acute tubercles; ♀ antennæ filiform. Body and wings snow white; palpi white, very slender; front of head brown black. Four small distinct discal dots. Primaries with three nearly equidistant, sinuate, wavy rather broad ochreous lines; the inner one sinuate, remote from the base of the wing. The middle one runs very near the discal dot, and is less sinuate than either of the two others. Outer line deeply twice sinuate. Fringe pure white. Hind wings like primaries, but with two ochreous lines beyond the distinct discal dot. Beneath both wings a little dusky, more or less thickly speckled with dark scales, with a conspicuous dark hair line half-way between discal dot and outer line on both wings. A row of dark marginal spots as usual on upper and under side of each wing.

Length of body, ♂ ·37, ♀ ·25–·30; fore wing, ♂ ·33, ♀ ·30–·38 inch.

Texas, May 2–8, Sept. 24 (Belfrage).

This pretty snow-white species may be readily recognized by the long pointed primaries, the slender white palpi, subpectinated antennæ and three distinct, sinuate ochreous bands on fore wings. The fore wings are longer than in *A. ossularia* (Hübn.), while the hind wings are more rounded.

Acidalia perirrorata, n. sp. Two ♂, four ♀. Compared with *A. ossularia* Hübn., with which this species structurally agrees, the wings are much produced, and the primaries still more acute. The front of the head is not colored differently from the body, and the palpi are stout, porrected, but not passing beyond the front. It belongs to a distinct section of the genus. Body and wings, including front and palpi, ash gray, paler than in *A. ossularia.* Fore wings crossed by three dark, distinct lines (often obscure); they are oblique, wavy but not sinuate, being straight in their oblique course. Inner line remote from the base of wing; second line runs just beyond the fine dark discal dot, nearly touching it, and much nearer the outer than inner line; outer line straight, parallel with the outer edge. Fringe pale gray, speckled finely with dark, dark at base. Hind wings paler than primaries, discal dot more distinct, with three faint lines beyond the discal dot. Beneath much as above, more densely dusted than above on both wings; posterior half of primaries, except on outer edge, clear whitish. Discal dots more distinct than above. The two outer lines on fore, and three outer on hind wings distinct.

Length of body, ♂ ·25, ♀ ·25; fore wings, ♂ ·38, ♀ ·36 inch.

Texas, June, July, August (Belfrage).

This peculiar species has the front not dark as usual, but concolorous with the body; this with the pointed fore wings, the dark fringe, straight lines and densely dusted wings, will separate it from any other species known to me.

Acidalia candidaria, n. sp. Unusually glistening white, free from dark speckles; body white; head black in front, palpi rather short, tip obtusely pointed, black above and at tips, beneath whitish. Antennæ white, densely ciliated; wings pure glistening white, with three ochraceous lines, oblique, very slightly sinuate; inner one smallest, not reaching the costa, the middle one the widest; submarginal one more sinuate than the others, not reaching the apex. A narrow marginal ochraceous line at base of white unspotted fringe, two lines of equal width on hind wings; the inner one straight, bent a little just before the costa, the outer bent in the middle and a little inwards. Beneath entirely white, costa of fore wings tinged with pale ochraceous; lines very faintly reproduced beneath; body and legs with a slight ochraceous tinge, hind tibiæ greatly swollen, white above, hind tarsi very short, only one-third longer than thickness of tibiæ.

Length of body, ·50; length of wing, ·60 inch.

Georgia (Leconte, Harris Coll.).

It differs from any northern species known to us by its white body and wings being unusually free from dots, by the three parallel pale ochraceous lines not reaching the costa of the fore wings, by the greatly swollen hind tibiæ, and by the black palpi, white beneath.

EUEPHYRA, nov. gen.

This genus is allied to Ephyra, notwithstanding that it has two pairs of well developed spurs on the hind tibiæ, though M. Guenée regards one pair of posterior tibial spurs as characterizing the group "Ephyridæ." It differs from Ephyra in the palpi being much longer, the third joint projecting far beyond the head, while the fore wings are much longer, more acute, and the hind wings are rather longer, fuller and rounder at the apex, and delicately scalloped. The wings are thinner and the moth slighter and more delicate than in Ephyra, its nearest ally. Unfortunately, the male has not yet occurred, so that this diagnosis must be quite imperfect.

Euephyra serrulata, n. sp. Four ♀. Pale reddish ash brown, head and palpi clearer, pale reddish brown. Both wings crossed by two remote dark hair lines, sinuate and wavy, the inner acutely angulated on the costa, and indented on the median vein. An outer line curved considerably outwards between the costa and lowermost branch of the median vein, the line most of its length parallel to the outer edge. Discal dot distinct, oval, white, circled with dull rust red on fore wings, with a darker circle on hind wings. Fringe long, concolorous with the wings, with a black line at base. Beneath with minute discal white dots. Wings paler than above, not speckled with brown, clear, with a single common outer curved line, and a dark line at base of the fringe.

Length of body, ♀ ·30; fore wing, ♀ ·33–·40 inch.

Texas, May and June (Belfrage).

This moth may be distinguished from the species of Ephyra to which it is allied in its coloration and style of marking, by the delicately scalloped or serrate hind wings, the pointed primaries, and the two wavy curved dark lines. It is marked beneath much as in *Ephyra myrtaria* Guen.

Aplodes approximaria, n. sp. One ♀. Wings much as usual, though the fore wings are broader and the hind wings more rounded and less angulated than in ♀ *A. mimosaria.* Front and outer half of palpi reddish brown. Fore wings white on the costa as usual. The two white lines much nearer together than in any other species, the inner line being remote from the base, ending nearly in the middle of the hind edge; it is scarcely curved, and with a slight angle on the median vein. Outer line farther from the edge than usual; not waved; bent slightly before reaching the costa. Hind wings with inner line almost obsolete, outer line much nearer middle of wing than usual, curved, not bent so much as in the other three species known to me. Fringe green, nearly concolorous with the body. Beneath, both wings greener than in any of the other species, with faint traces of the outer line on the fore wings. Two anterior pairs of legs bathed in pale brown. Abdomen greenish on basal half, with a dorsal pale line.

Length of body, ·40; fore wings, ·53 inch.

Albany? (Lintner).

This pretty green species differs from the others of its size in its red front, leaving but a narrow white anterior margin; its brown legs, the close approximation of the two lines on fore wings, and in the slightly bent and curved line on hind wings; also by the greenish fringe, and by both wings being greener than usual beneath.

Aplodes rubrolinearia, n. sp. One ♂. Structurally very near *A. mimosaria*, but differs from it and the other two species in the peculiar glossy silken lustre of the wings. Antennæ and palpi as in *A. mimosaria*, palpi reddish on the two terminal joints; front reddish. Wings not so deep green as in *A. mimosaria*. Fore wings white on the costa as usual; inner line situated the same distance from the base of wing as in *mimosaria;* wavy, angulated distinctly outward on the median vein. Outer remote from inner line, a little wavy and a little narrower than usual. Secondaries with the two lines well marked, remote inner one distinct, very near base of wing, curved and waved; outer line slightly wavy, curved outwards more than usual in the middle of the wing. Fringe of a peculiar pale silken green lustre with a faint narrow red line at base (this line easily overlooked). Abdomen with a white spot at base, and with two white distinct bands on two following segments; terminal third white. Fore legs whitish brown, ringed with white; two hinder pairs white. Wings beneath whitish green; costa of fore wings white. The outer line faintly reproduced on the fore wings.

Length of body, ·41; fore wing, ·46 inch.

Philadelphia, Penn. (Coll. Amer. Ent. Soc.).

This species may at once be identified by the faint linear reddish line at base of fringe.

Aplodes latiaria, n. sp. One ♂. Pale pea green. Front reddish above, below white; palpi reddish on the outer half; antennæ pectinated as usual. Wings of the usual form; fore wings white on the costa; the two lines remote; the inner very near the base of wing, a little curved and slightly waved. Outer line rather broader than usual, at the same distance from outer edge as usual, slightly bent before reaching the costa. Hind wings with no basal line; the outer line rather broad, bent in the middle, not rounded, as in the two other species of its size, but much as in *A. mimosaria*. Fringe whitish, nearly concolorous with the lines. Abdomen with a round white spot at base. Beneath whitish, green on costal half of fore wings, with the line faintly reproduced.

Length of body, ·42; fore wing, ·50 inch.

Albany, N. Y. (Lintner).

This delicate species may be known by the front being half red and half white, by the outer line being rather broader and the two lines on fore wings rather farther apart than usual; also by the single line on the hind wings being angulated, not curved in the middle. In this respect it differs from the two other species of its size, *A. rubrolinearia* and *A. approximaria*.

Synchlora albolineata, n. sp. Four ♀. Pea green; a white stripe between the antennæ, which are also white, and beneath pale testaceous; palpi and legs white; front and pectus green; a green stripe on the fore trochanters. Palpi very long, extending out nearly twice the length of the head. Fore wings with the costal edge white; a basal curved line, slightly dentate on the venules. Discal dot very linear, pale, obscure. Outer white line parallel with the outer edge, dentate on the venules. Edge with white dots on the venules. Fringe pale green (on the rest of the wing). Secondaries with a much curved basal white line, a discal dot linear small white; outer line very dentate on the venules, much more so than the same line on fore wings. Fringe pale, edge with white dots on ends of venules. Beneath, fore wings testaceous, whitish on costal edge, fringe white; anterior half of wings greenish, posterior whitish. Secondaries whitish; the line appears, though very faintly. Abdomen green, streaked mesially with white.

Length of body, ·43; length of fore wing, ·54 inch.

Maine (Packard); Boston (Sanborn); Natick, Mass. (Stratton).

Synchlora rubrifrontaria, n. sp. Closely resembling *S. albolineata*, but differing in the front and palpi being ochreous brown, as also the fore tibiæ; the fore wings are a little more prolonged towards the apex, but the markings and coloration of the wings and body are almost identical, except that the basal line on the hind wings is much less curved than in the other species, and the lines generally are a little less curved, but about the same distance apart.

Length of body, ·38; length of fore wing, ·50 inch.

West Farms, New York (Angus). Two ♀.

Synchlora excurvaria, n. sp. Two ♀. Of the usual form. Front green. Palpi green, tipped with pale brown. Fore wings whitish on the costa, the two lines much as usual and at the usual distance apart; inner line sinuate; outer line on both wings more irregular and wavy than usual, approaching the outer edge more on the median venules. The usual white line on the abdomen. Beneath whitish, greenish on costal half of fore wing; two anterior pairs of legs, greenish at base; fore tibiæ washed with pale brown.

Length of body, ·30; fore wing, ·40 inch.

Waco, Texas, Oct. 10 (Belfrage).

This species differs from the two others by the outer line being more wavy and curved outwards nearer the outer edge of the wing, as well as by its much smaller size.

Racheospila rubrifrontaria, n. sp. ♂. Front pale ochreous brown; front edge and clypeus pale, concolorous, slightly roseate at tip; vertex white between the antennæ, margined behind with ochreous brown. Antennæ pale testaceous, whitish above. Wings pea green as usual; costal edge of primaries whitish; an inner slightly curved, irregularly undulating line. An outer more distinct straight line, a little waved just before the costa, where it becomes obsolete; outer half of fringe rosaceous. On the secondaries but one line, bent a good deal in the middle. Beneath paler, the lines appearing faintly through. Thorax green, a white blister at base of abdomen; on third and fourth wings a white spot, margined irregularly with dull ochreous; beyond abdomen white. Legs concolorous with the front.

Length of body, ·50; length of fore wing, ·53 inch.

Mass. (Sanborn).

The ochreous brown front, legs and palpi tipped with rosaceous, the abdomen green at base, with the conspicuous white blister, and the two succeeding spots edged with dull ochreous will distinguish this not uncommon species.

EUNEMORIA, nov. gen.

♂. Allied more closely to Racheospila than any other genus of this group. The front is unusually broad and square, much more so than in Racheospila. Palpi short, small and weak, not extending beyond the front, much as in Racheospila. Tip subacute, hairy; terminal joint short, pointed, partially concealed in the hairs of the second. Antennæ short, just half as long as the fore wings, stout, thick at base, well pectinated on the basal two-thirds, terminal third simple. Wings of much the same shape as in Racheospila, but the outer side is more oblique. The hind wings are of the same shape as in Racheospila; not angulated mesially, but well rounded on the outer edge. All the venules are shorter than in Racheospila, originating farther out towards the outer edge of the wing. The body is shorter and stouter, and the abdomen is not ornamented with pale pustules or reddish scales, but with curved waved narrow lines of white. The front is more like Nemoria than Racheospila; the genus is intermediate in its characters between these two. The palpi are like those of Racheospila, being much shorter and smaller than in Nemoria, though not slender, while the costal border is not so broad as in Nemoria.

Eunemoria gracilaria, n. sp. ♂. Front dull green; palpi pale, tips slightly fuscous; antennæ pure white throughout. Thorax green, abdomen white, nearly reaching to the inner angle of the hind wing. Wings uniformly pale pea green, costa of fore wings white, with an inner curved white line, indented on the venules. A distinct waved curved unidentate discal line; outer line regularly curved; basal half of fringe green. On hind wings basal line more curved than on fore wings; outer line angled in the middle. Beneath, pale whitish greenish towards costa, especially on fore wings; costa itself white. The lines appear through, though faintly.

Length of body, ·33; length of fore wing, ·36 inch.

"Mass., Aug. 5" (Harris Coll. Bost. Soc. N. H.).

Eupistheria sulphurea, n. sp. ♀. Uniformly sulphureous; palpi large, stout, porrect, reaching far beyond the head; concolorous with the head and rest of body. Antennæ thickly ringed with brown. Wings sulphur yellow, with three triangular costal brown spots, a large brown discal dot, and a similar spot on the outer third of the inner margin; a few transverse strigæ, but no lines as usually seen in this genus. On the hind wings two rows of large diffuse spots, both beyond the discal dot, the inner of which only reaches to the middle of the wing, while the outer is more regular, following the line of the outer edge of the wing. Fringe long, brown, on the hind wings interrupted with ochreous; at base on both wings a marginal row of dark dots. Beneath much more strigated than above. Veins very distinct, being deeper ochreous than on the interspaces.

Length of body, ·38; length of fore wing, ·45 inch.

Brookline, Mass. (Shurtleff); Natick (Stratton).

Easily known by its pale sulphur yellow hues, the usual lines on the fore wings being obsolete, more distinct on the hind wings, where there are two lines, and by the three costal triangular spots, while beneath the wings are much more strigated than above.

Eupistheria ferruginaria, n. sp. ♂. Light ferruginous reddish brown, ochreous on the costa, darker towards the outer margin; dusted with transverse strigæ, especially conspicuous on the costa of the fore wings, and on the hind wings three transverse dark brown lines, dilating broadly on the costa, the two basal ones angulated on the median vein, the third curved, especially on the anterior half of the wing; the outer triangular costal spot half way between the third line and the tip; fringe long, dull, smoky. Hind wings somewhat paler, ochreous, with two very distinct dark lines, the inner straight, the outer obtusely angulated in the middle. A narrow discal dot on both wings, but most distinct on the hind wings. Beneath bright ochreous, tinged with reddish on the venules; the lines reappear beneath, being broader and more diffuse; the wings speckled thickly with ferruginous on the basal half. Legs very long and slender; tibiæ and tarsi dark; femora paler, speckled.

Front of head and palpi concolorous with rest of body; about the same size as the preceding species.

Maine (Packard), June and July, in pine woods.

This form may easily be recognized by the reddish ochreous wings, the continuous lines, and the yellowish under side.

Cleora pellucidaria, n. sp. Two ♂. A rather larger and more dusky smoky pellucid species than the foregoing. Head white, front a little dusky; antennæ as in *pulchra;* palpi dark. Thorax and body pale mouse colored. Wings of same hue. Inner line not so much curved, and outer line much as in *pulchra*, but with the three teeth a little longer and less even. The lines are duller and do not contrast so much with the rest of the wing as in *pulchra*. Fringe mouse colored, with faint dark checks. Beneath as above, but more uniformly mouse colored, with outer line as on fore wing very faint, and no markings on hind wing, or with the outer line indistinct, but common to both wings.

Length of body, ·55–·65; fore wing, ♂ ·67–·80 inch.

Maine (Packard); Albany (Lintner).

Differs from *C. pulchra* Minot, in the semitransparent smoky pale mouse-colored wings, the white front and the more even and fine specks producing the peculiar smoky tint.

Hesperumia nov. gen.: *sulphuraria*, n. sp. Two ♂. Body and wings deep sulphur yellow; sides of the head and palpi ferruginous; antennæ dark ochreous; on the fore wings is a ferruginous incomplete basal curved line, largest on the costa; a diffuse slightly sinuate line passing just outside and partially inclosing the very large orbicular brown discal ring, irised with yellow; an outer submarginal broadly sinuate line, more distinct than the inner two; diffuse, dilated on the nervules, and especially on the costa; within and along the outer edge are a few transverse ferruginous strigæ; fringe ferruginous. Secondaries very pale towards the base, with a few strigæ towards the outer edges; no lines or discal dot. Beneath, the wings are clear, with sparse irrorations on the costal and outer border of the wing, and the discal dot is a round obscure spot, smaller than above and centred with yellow; a single wedge-shaped mark on the outer fourth of the costa marks the site of the outer line. Fringe dark brown as far as the inner angle of the fore wings; pale on the secondaries, concolorous with the rest of the wing.

Length of body, ·48; of fore wing, ·66 inch.

Streaked Mountain, Paris, Maine, July 22 (S. I. Smith, Mus. Yale College).

It may be recognized at once by the unusually large brown ring, pupilled with yellow, by the two mesial bands which approach each other on the costa and hind edge, and by the brown fringe on the fore wings, becoming yellow at the hind angle and margin. The species, from the two specimens before us, evidently varies in the distinctness of the lines and discal spots, as they tend to become obsolete in one.

This genus will be characterized in the Proc. Bost. Soc. Nat. Hist. for May, 1873.

Heterolocha sulphuraria, n. sp. Two ♀. Uniformly sulphur yellow, above and below, the outer edge of wing not being brown, as usual. Head and palpi brown, rest of body sulphur. Legs brown. Fore wing with basal third of costa brown on extreme edge. Inner line obsolete, a few minute pale reddish brown spots indicating its site. Outer band consisting of two brown spots on inner edge of wing, forming a two-scalloped short band, reaching to the third median venule, the inner edge being deeper brown; two or three scattered diffuse spots (or none) connect the band with the subapical costal large triangular spot, which is either brown, or with paler scales (white and yellowish) in the centre. Minute brown flecks forming an obscure line (wanting in one specimen) midway between the outer line and the edge of wing. Fringe on both wings yellow, with a brownish hair line at base. Hind wings clear, except an obsolete transverse band, indicated by a double brown abbreviated line at outer third of inner edge. Beneath more spotted than above. Outer line with a large patch in the middle of the wing, discal dot minute. This species (as also another from the Middle States which differs in having the outer edge of both wings broadly bordered with brown, but with the large triangular costo-apical spot, though the specimen, from Clemens' collection, is too imperfect to be farther characterized) has unusually angulated wings, the hind wing being produced into a decided tail, where in the Californian *H. Edwardsata* the fore wings are scarcely angulated, and in the hind wing they are rounded.

Length of body, ♀ ·55; fore wing, ♀ ·70 inch.

Two distinct sections of the genus.

West Farms, N. Y. (J. Angus); Middle States (Ent. Soc.).

Caberodes carnaria, n. sp. One ♂. This species belongs to a separate section of the genus, the wings being more angulated than usual, and outer line on fore wing running straight to the costa, not being reflexed. Ash, darker than usual, with a salmon tint, especially about the lines, and on the under sides of the wings. Head reddish brown in front and on the palpi, which are stout, and pass considerably beyond the front; the vertex is whitish ash. Wings salmon ash gray, a little darker between the two lines; both lines pale, testaceous, edged on sides facing discal dot with brown; they are distinct, not blended with rest of the wing. Inner line oblique, slightly curved; the outer line is oblique, ending next to the apex; on the costa a broad pale space between the line and the dark apical streak below, the line being margined externally with a faint brown line. Just beyond this line the wing is clear and paler, as within the inner line, and with dark flecks, but the edge of the wing is as dark as in the middle. Discal dot black, small, curvilinear, distinct. Fringe brown, with a paler fine line at base. Hind wings a little paler and more transversely strigated than fore wings; a single straight line, just beyond the middle of the wing, like the outer line on fore wing. Beneath paler than above, carneous ash. Veins and common line with a decided reddish tint, especially towards apex of fore wings. The line is very diffuse, especially on hind wings. Both pair of wings are transversely strigated. Fringe brown beneath and darker on edge of fore wings. On hind wings the line is a very diffuse shade.

Length of body, ♂ ·45; fore wing, ♂ ·50.

Lansing, Mich. (Miles).

Caberodes cervinaria, n. sp. Two ♀. Head and palpi ochreous, much lighter than rest of the body. This belongs to a third section of the genus, the apex of the wings being acute, but the angle in the middle obsolete; otherwise the markings are as usual in the genus. Body and wings fawn colored, being much darker than in any other of the species except *C. carnaria.* Both wings uniform fawn, with fine dark speckles. On fore wing between the two lines darker, with a large distinct discal dot, the two lines blackish, fine, inner curved, especially towards the costa; in the other specimen much less curved. Outer line slightly oblique, less so than usual, ending on costa farther from the apex than usual, in fact being just parallel to the outer edge of the wing; it is a little sinuate; distance between lines varies, the space being half as wide in some as in others. Fringe concolorous with wings. Hind wing a little darker inside of the line than outside; the line is as on fore wings and considerably curved. A very faint discal dot. Beneath uniformly fawn ash, being lighter than above; the lines are obsolete, but the median shade on fore wings faintly appears through, and the discal dots are small but distinct; the wings are regularly and finely speckled.

Length of body, ♀ ·33; fore wing, ♀ ·50 inch.

Texas, May 8 (Belfrage).

Known by the fawn colored wings, the median shade bounded by dark lines, and by the outer line ending on the costa much farther from apex, and not bent back on the costa as usual in the genus.

NOTES ON NORTH AMERICAN MOTHS OF THE FAMILIES PHALÆNIDÆ AND PYRALIDÆ IN THE BRITISH MUSEUM. BY A. S. PACKARD, JR.

DURING a short stay in London I was enabled to spend a few days in the British Museum and study the collection of moths named and arranged by Mr. F. Walker, forming a part of the types of the species described by him in the Catalogue of the Lepidoptera Heterocera of the British Museum. I am indebted to Dr. J. E. Gray, the keeper of the Zoological Department, to Mr. F. Smith, and also to Mr. Walker, for many courtesies and facilities extended to me. Though Messrs. Grote and Robinson* have already published some notes on these families, I present for publication these, containing references to all the species of Phalænidæ and Pyralidæ in the Museum from North America, to aid American entomologists in the thankless and well nigh impossible task of identifying our species from the too brief and insufficient or misleading descriptions contained in the museum catalogue of Heterocerous Lepidoptera, and also for my own use in my museum work.

Messrs. Grote and Robinson have fully expressed the feelings I entertain regarding the nature of these catalogues. Their publication will forever be a sad hindrance to American lepidopterists, and a warning to students to describe fully and *comparatively* their species, and from a sufficient number of specimens. A number of leading European entomologists have also expressed their opinion as to the value of these lepidopterological catalogues. In endorsing their criticisms I can but advert to the doubtfully expedient course of the officers of the museum in accepting and publishing such imperfect and unsatisfactory work. As it is, the species described in these catalogues, as may be seen below, can only be recognized by personal examination of the specimens, since so many are referred to wrong genera, or based on rubbed and imperfect specimens. When there is any doubt about the description, the safer course is to ignore it altogether. These notes refer simply to the specimens as they stand in the museum, and not to the published lists. I have not attempted here to collate them with the names in the catalogues or with the names of other authors; so that the name given here may be quite different either from the published or correct one. A mark of exclamation (!) is placed after the names of such species as seemed to me valid, so that students of the catalogue may be sure that such names represent a distinct species, and are not founded on some imperfect specimens of allied species or genera. In a few cases names believed by me to be correct are enclosed in brackets. The notes are printed just as written on the spot.

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*Notes on the North American Lepidoptera in the British Museum and described by Mr. Francis Walker. (Trans. Amer. Ent. Soc. Vol. 2, 1868-9.) Philadelphia.

Choerodes incurvata (Florida), specimens same as *C. transmutans* from Fla! and both are the same as *C. transposita* and *C. transversata!* *C. transposita* is the dark var. with submarginal zigzag shade. *C. transversata* is the paler var. with the zigzag shade wanting, and borders of both wings subochreous.

C. transvertens, one ♂ only. Is a var. of C. transversata.

C. contingens, scarcely a var. of C. transversata.

C. transducens = ♂ Eutrapela clemataria!

C. transferens = ♀ E. clemataria!

The other species of *Choerodes* are good.

In drawer 3 are 6 ♂ labelled *Eutrapela clemataria* — same as the single ♂ *E. clemataria* labelled *C. transducens.*

Apicia arbuaria is a small Caberodes, and *A? agathoaria* is not congeneric with it, or congeneric with *A? rithrusaria.* There is no species of Apicia in the collection.

Priocycla armataria!

Epione calipusaria = Sicya solfataria.

Epione serinaria! There are two specimens of this species labelled *E. solfataria.*

Epione agyllaria is a good species; from St. Martins' Falls.

Epione pustularia is neither Epione nor Sicya. Do not know what it is; reminds me of Drepanodes, but too much rubbed for identification.

Sicya truncataria; there are no examples.

Hyperetis alienaria!

H. nyssaria. One of the specimens (*b*) does not differ from H. alienaria. The other (*a*) is a ♀, dark, finely preserved, but conspecific, and I should unite *nyssaria* with *alienaria.*

H. subsinuaria seems to be a small, dark, well marked var. of *alienaria*, but scarce anything more.

H. nepiasaria!

H. irregulata is not a Hyperetis. Do not know what it is. No locality.

Endropia pectinaria; the 4th specimen is a Selenia!

E. pectinaria = E. deductaria Walker's type; one specimen is a rubbed *E. pectinaria* Walk.!!

E. hypochraria!

E. metusaria = *E. hypochraria.*

E. refractaria is a much rubbed *E. hypochraria.*

E. astylusaria!, a good species, closely allied to *E. pectinaria* of Walker.

E. madusaria a good species, closely allied to *E. amœnaria.*

E. oponearia does not differ from *E. madusaria.*

E. muzaria!

E. propriaria is a rubbed *E. tigrinaria.*

E. tiviaria. A good species.

E. semiclusaria is a large Cleora.

Ellopia subprivata, much rubbed = *Epione serinaria!*

E. pultaria!

E. perfidaria = *fiscellaria*, both = *E. flagitiaria.*

E. panisaria, one specimen is a true *E. pultaria*, and the other is = *Endropia lateritiaria!*

E. athanaria is nearly related to *E. seminudata*, and both are apparently good species.

Ellopia? amyrisaria is a Caberodes! and too much rubbed for identification or description.

E. plagifasciata is a Numeria.

E. basiaria = E. incoloraria, both species of Acidalia.

E. deplanaria is an Endropia.

E. scitata is probably the common E. flagitiaria.

E. ribearia = Abraxas ribearia.

E. myandaria is a Caberodes!

Caberodes imbraria!

C. remissaria!

C. superaria = C. remissaria! both may prove to be dark varieties of *C. floridaria* Walk.

C. phasianaria [= C. metrocamparia].

C. antidiscaria!

C? agreasaria = Endropia lateritiaria.

Tetracis aspilata!

T. pandaria is a large rubbed *Caberodes metrocamparia!*

Eurymene phlogosaria!

E. alcoolaria!

Selenia œsionaria is a large singular species of Hyperetis!

S. alciphearia!

Azelina neonaria is a true *Hyperetis alienaria.*

A? zalissaria is a true Azelina closely allied to *A. Hübneraria.* It is a good species.

Metanema inatomaria!

Ennomos magnaria!

E? arsesaria [= Tetracis ægrotata!]

E. subsignaria!

Caripeta angustiorata [= Parennomos piniaria Pack.!]

C. latiorata!

C. divisata!

Biston ursaria!

Amphidasys cognataria!

A. sperataria!

Boarmia momaria!

B. humaria! All the specimens rubbed.

B. intraria!

B. defectaria = B. larvaria.

B. indicataria!

B. signaria = B. sublunaria.

B. filaria!

B. transfixaria is ♀ of *B. intraria*, represented by 2 ♂.

B. sublunaria!

B. albigenaria!

B. ephyraria = B. humaria!

B. intractaria is a rubbed *B. momaria.*

B. signataria is *Tephrosia Canadaria!*

B. plenaria, from Mexico, is a good species.

Tephrosia Canadaria!

T. spatiosaria = Boarmia sublunaria.

T. abraxaria!

T. intractaria is a rubbed *B. sublunaria!*

T. submuraria!

T. dispuncta is a *Macaria.*

Tephrosia? comptaria are two rubbed specimens of *Tephrosia scitularia*, which is a small *Cidaria.*

T. notaria [= *Fidonia bicoloraria* Minot!]

T. imperfectaria, of this species there is only a poor single specimen.

T. amplaria = Bronchelia disserptaria, both = B. liriodendraria.

Stenotrachelys approximaria!

Geometra inclusaria!

Jodis tractaria [= Aplodes mimosaria Guenée.]

Nemoria subcroceata!

N. incertata. Almost too much rubbed for identification.

Dyspteris abortivaria!

Aplodes glaucaria!

Ephyra myrtaria! E. stabilita! E. solitaria!

Acidalia purata!

A. tacturata!

A. impauperata!

A. ordinata!

A. restrictata!

A. enucleata!

A. compensata!

A. timandrata!

A. quadrannulata = *Ephyra myrtaria!*

A. restorata!

A? fissinotata = Tephrosia dispuncta and Macaria granitata and Larentia? exnotata.

A? sparsaria is scarcely an Acidalia.

Stegania pustularia!

Cabera erythemaria!

C. intentaria!

Corycia vestaliata!

C. albata!

Macaria granitata!

M. haliata = M. granitata! Not even a variety!

M. æmulataria!

M. laticincta is a Hyperetis allied to *H. alienaria.*

M. æquiferaria! M. inaptata! This is not a Macaria.

M. transitaria!

Macaria? submarmorata is a good species. It is a true Macaria.

M. postrema is a rubbed *M. æquiferaria! Macaria impropriata* is a Paraphia too much rubbed for identification.

Macaria? indeclinata = Endropia hypochraria!

M. integraria is an Aspilates.

M. inextricata!

M. exauspicata is entirely too much rubbed and can probably never be identified.

M. tractata!

M. irregulata = M. granitata.

M.? refusaria is too much rubbed for identification, probably a rubbed M. granitata, and I should call it a synonyme.

M. retinotata = M. granitata!

Halia subcessaria is very near *H. wavaria,* but ground color much whiter.

Tephrina expressaria! is a species of Boarmia.

Lozogramma defluaria.

L. extremaria!

Numeria occiduaria!

N. obfirmaria!

Fidonia truncataria!

F. discospilata !

Hæmatopis grataria !

Aspilates atropunctaria !

A. canosaria [= Cleora pulchra of Minot] !

Napuca orciferata !

Zerene catenaria ! A *Cleora pulchra* is among the specimens placed under this name.

Anisopteryx sericeiferata [= A. vernata Peck].

Larentia? fidoniata [= Fidonia bicoloraria].

Larentia flammifera !

L. cervinifascia !

L. basaliata !

L. ziczacata !

L. placidata = L. ziczacata !

L? exnotata = Macaria granitata !

L? renunciata is our common Ypsipetes pluviata.

L? exornata !

L. costinotata [= is Tephrina strigularia (Minot sp.) !]

Eupithecia implicata !

E. explanata !

Lobophora fusifasciata !

Thera? bitactata !

Ypsipetes? immersata [is Tephrosia disconventa *fide* Grote.]

Melanthia ruficillata !

M. gratulata !

M. gothicata !

M. reciprocata [= Odezia albovittata Guen.]

M. concordata !

M. lacustrata !

M. intermediata = M. lacustrata.

M. ideata = M. lacustrata.

Coremia propugnata !

C. ferrugata !

C. obruptata is a Camptogramma. The species good.

Camptogramma gemmata !

C? abruptata, St. Martin's Falls, is a genus not known to me; it is based on a poor specimen.

Phibalapteryx erosiata !

P. intestinata !

P. Floridata = P. intestinata.

Scotosia dubitata !

S. undulata !

S. lobophorata is not a Scotosia.

S. inexplicata is probably not a Scotosia and too much rubbed for identification. The specific name is exceedingly appropriate.

Cidaria russata !

C. remotata !

C? gibbicostata [= Tephrina strigularia (Minot)].

C. diversilineata !

C. propulsata !

C. molliculata may prove to be a var. of *C. remotata.*

C. cunigerata !

C. inclinataria seems to be a true *Coremia !*

C. rigidata !

C. explagiata ; one broken and rubbed specimen.

C. albifusata !

C? frigidata is an Ypsipetes !

Pelenga similis is closely allied to Cidaria propulsata.

Anaitis orillata !

Heterophleps atrosignata is Halia successaria.

PYRALIDÆ.

Hypena Baltimoralis !

H. rufinalis is a Crambus.

H. damnosalis !

H. scabralis !

H. benignalis is a variety of H. Baltimoralis.

H. bijugalis is a variety of H. Baltimoralis.

H. edictalis !

H. generalis !

H. deceptalis !

H. manalis !

H? Idæusalis is not a Pyralid; perhaps a Tineid.

H. caducalis!

H. germanalis is near, if not the same as *H. humuli* Harris.

H. cæcalis! Is it a Hypena?

H. edutalis!

H. sobrialis is not a Hypena.

H. cacuminalis. Too much rubbed for description.

H. fractiosalis. A good species, but is it a Hypena?

H. fallacialis!

H. habitalis!

Doryodes acutalis [not *D. acutalis* Guen.] is a genus allied remotely to Hypena.

Hormisa absorptalis!

Rivula propinqualis!

Herminia morbidalis!

H. pedipilalis!

H. curvalis!

H. jacchusialis!

H. theralis! Too much rubbed for identification.

H. gyasalis = H. pyramusalis.

H. pyramusalis = H. gyasalis.

H. protumnusalis!

H. eumelusalis!

H. metonalis! Specimens in bad condition.

H. biferalis! Specimen in bad condition.

H. cloniasalis!

H. phalerosalis!

H. salusalis!

H. heliusalis!

H. clitosalis!

Bleptina surrectalis is the common large Aglossa.

B. mynesalis!

Epizeuxis goosalis is not a Helia.

E. lituralis!

Palthis angulalis!

Pyralis farinalis!

P. hyllalis!

Aglossa cuprealis!

Ennychia glomeralis!

Desmia funeralis!

D? janassialis!

Ædiodes minualis!

Samea ebulealis!

S. elealis!

S. phyllisalis!

Asopia archasialis!

Agathodes monstralis!

Paraponyx allionealis!

Hydrocampa itealis! Not a true Hydrocampa; wings much longer.

Zebronia serinalis, but with longer wings than usual in the genus.

Leucochroma icciusalis!

Phakellura nitidalis!

Ph. hyalinatalis!

Ph. immaculalis!

Botys argyralis is *B. ventralis* G. & R. their label annexed.

B. verticalis!

B. apertalis!

B. strictalis!

B. theseusalis!

B. siriusalis!

B. licealis!

B. olliusalis!

Isopteryx? obliteralis! The species is a good one.

I? leucothoalis! The species is a good one.

Oligostigma seminealis!

O. curviferalis!

Catyclysta lamialis!

C. claudialis!

C. principalis!

C. confusalis!

Botys obliteralis and *B? pantheralis* are considered as synonymes by Walker, one specimen representing both labels. Specimens too much rubbed for identification.

B. thyasalis = B. apertalis and B. oxydalis. Placed together by Walker.

B. mysippusalis = B. periusalis.

B. periusalis = B. mysippusalis.

B. arsaltealis!

B. thymelusalis!

B. œglealis!

B. illutalis!

Pionea ennusalis!

P. sculpturalis [= *Pantographa lineata* G. & R.]

P. helvalis, too much rubbed for description.

P. dionalis! " " "

Spilodes nisœecalis, too much rubbed for identification.

Scopula rubigalis, *S. orasulalis*, *S. nesturalis*, *S. commixtalis. Mecyna reversalis.* All founded on poor, unrecognizable specimens.

Stenopteryx hybridalis!

ON THE CAVE FAUNA OF INDIANA. BY A. S. PACKARD, JR.

THE Museum of the Academy of Natural Sciences has received from Prof. E. T. Cox, State Geologist of Indiana, Dr. John Sloan of New Albany, Ind., and M. N. Elrod, Esq., of Orleans, Ind., some important material elucidating the cave and subterranean fauna of Indiana, an account of which, with the localities, is here presented.

DIPTERA.

Anthomyia? Five specimens of this fly occurred in a cave at Bradford, Ind. (Dr. John Sloan). It is of the same species as the Anthomyia? mentioned by Mr. Cope as occurring in Wyandotte Cave, as I find by comparing them with his type specimens kindly lent me.

COLEOPTERA.

Anopthalmus tenuis Horn. Two specimens were received from Mr. Elrod, taken from a cave at Orleans, the locality being remote from the light. One specimen is considerably paler than the other, but both agree with Dr. Horn's description.

Platynus marginatus Lec. (determined by Mr. P. S. Sprague). This species, with eyes of the normal appearance, occurred in company with *A. tenuis*, in the same cave and "remote from the light." Its pupa was also found with it, hence it is probable that the larva lived in the same situation. The pupa had well formed eyes.

ORTHOPTERA.

Ceuthophilus Sloanii, n. sp. One ♂, three ♀. This species is allied to *C. maculatus*, having much the same markings, but the thoracic brown bands are better marked and the body is rather paler. Eyes rounded pyriform; a dark spot beneath each eye and a longer one between; a brown band connects the eyes above. Antennæ three times as long as the body; at intervals, increasing distally, conspicuously banded with pale. Legs unusually short, of much the same proportions as in *C. maculatus*, the joints being short and stout. Hind femora marked and spined as in *C. maculatus*, but without the twist seen in that species. Anal cerci as in that species. Ovipositor in my (probably immature) specimens very short and blunt, unarmed.

Length of body, ·55; antennæ, 1·60; hind femora, ·50; ovipositor, ·10 inch. From *C. latens* Scudd., Jour. Bost. Soc. N. H., vii, 437 (1862), an Illinois species, it differs in the still shorter femora.

From a cave in Bradford, Ind. (Dr. John Sloan). I dedicate this species to Dr. Sloan in recognition of the interest shown by him in extending our knowledge of cave life.

CRUSTACEA.

Cambarus pellucidus (Tellkf. 1844). Orconectes inermis Cope, Amer. Nat. vi, 419, 1872. On comparing one small specimen of this species from Wyandotte Cave, measuring 1·45 inch, with one 1·70 inch long, and several others larger, from Mammoth Cave, I am unable to find any but the slightest differences in the proportion of different parts, or in ornamentation; such differences as do exist seem to be simply individual. Being a little younger specimen than those from Mammoth Cave, the spines in the Wyandotte individual are not quite so large, but the frontal spine is the same, as well as the chelæ and the end of the abdomen and its appendages. The terminal spine extends a little beyond the apex of the antennal lamellæ. The lateral ridges on the sides of the rostrum are thicker and more strongly marked than in the Mammoth Cave specimens. The antennal lamellæ are alike in specimens from both caves. The spines on the side of the thorax are smaller in the Wyandotte Cave specimen, and those above are rudimentary. The postabdomen is as in Cope's figure and in the Mammoth Cave specimens. I should regard Prof. Cope's specimens, judging from his descriptions and figures, as belonging to *Cambarus pellucidus*, and not even a variety. The absence of pigment in the eyes, and the loss of sight, I should scarcely regard as of generic value, and am hence inclined to follow Dr. Hagen in retaining *pellucidus* in the genus *Cambarus*. One specimen from Wyandotte Cave, presented by Prof. E. T. Cox.

Crangonyx vitreus (Cope), Stygobromus vitreus Cope, Amer. Nat., Vol. vi, p. 422. This species agrees in the main with Prof. Cope's description so far as I am able to comprehend it. The antennæ and their proportions are as he describes them, and in this character and that of their being eyeless and of the same size, my specimens agree with his description, so that I am inclined to regard them as of the same species as those from Mammoth Cave. In my specimens the second antennæ are half as long as the first pair. In this respect the species approaches the European *C. subterraneus* Bate (British Sessile-eyed Crustacea, i, 327), though the antennæ are longer and slenderer than in that species. It differs from *C. gracilis* Smith (Report on Dredging in Lake Superior, 1871), specimens of which have been obligingly furnished me for comparison, in being eyeless, and in the antennules being scarcely half the length of the body, while the antennæ are half as long as the antennules; in *C. gracilis* they are about two-thirds as long; flagellum shorter than in *C. gracilis*. In the form of the body and abdominal appendages it closely resembles *C. gracilis*. The antennules 17-jointed; in *C. gracilis* 23-jointed. The antennæ 8–10-jointed; in *C. gracilis* 10-jointed. Taken from three different wells in Orleans, Ind., in company with *Cæcidotæa stygia* "and blind crawfish and the blind fish" (M. N. Elrod).

Mr. Elrod thus writes me under date of June 4th: "I have collected over a hundred Cæcidotæa and a number of Crangonyx from a well in town. They were in and on the buckets that had been in the bottom of the well for several days. I also have a live eyeless crayfish from one of our wells yesterday, and have fed it with Cæcidotæa. If the Cæcidotæa are put in its claw it eats them almost instantly."

Cæcidotæa stygia Pack., Amer. Nat., Vol. v, p. 751, *C. microcephala* Cope, Amer. Nat., Vol. vi, pp. 411, 419. Having received Prof. Cope's type specimens from Wyandotte Cave, and compared them with my Mammoth Cave individuals, I am unable to find any differences. Prof. Cope was undoubtedly led to regard his *C. microcephala* as distinct from mine, owing to an error in my engraving of the head, which is represented as being too long and broad in front, while his specimens are, from being badly preserved, too much flattened and narrow in front, and so represented in his figure. But having received through Prof. E. T. Cox, some better preserved specimens from Wyandotte Cave, I am enabled to state that *microcephala* does not differ from *stygia*.

Having received from Mr. Elrod numerous specimens in a better state of preservation than the single one on which my description was founded, *i. e.*, having the larger pair of antennæ and caudal appendages (uropoda) attached, I am able to correct an important misconception of my own regarding the affinities of *Cæcidotæa*, and of Prof. Cope respecting the nature of the so-called "egg-sacs." The genus is not a member of the family *Idotæidæ*, but of the *Asellidæ*, and the "egg-sacs" are uropoda. Indeed, it seems not difficult to recognize in *Cæcidotæa* an *Asellus* modified by its subterranean existence. The antennæ and legs are much the same, though a little longer; the body, however, is much lengthened and bleached out, and the eyes have disappeared. The gills are much the same. Had I at the time of writing my description of *Cæcidotæa* had an *Asellus* with which to compare it, I do not think I could have fallen into the error of regarding it as an ally of *Idotæa*, but the apparent absence of uropoda and the difficulty of seeing any place of attachment for any, together with the consultation of figures alone, misled me. The outer antennæ are as in *Asellus*, but the joints are much longer; while in *Asellus* they reach a little beyond the base of the abdomen, in *Cæcidotæa* they reach a third of their length beyond the end of the abdomen. Inner (and smaller) antennæ as in *Asellus*. Legs as in *Asellus*, but slenderer and less spiny. The two pairs of appendages at base of abdomen much as in *Asellus*. The uropoda are long and slender, longer than the terminal abdominal segment; basal joint long and narrow; two terminal joints very unequal, outer one minute, scarcely as long as the basal joint is wide; inner joint long, four times as long as the outer, and half as long as the basal joint. Compared with those of *Asellus*, they are quite different, as in the latter genus the basal joint is broad and shorter than the two terminal joints; and of the latter the outer is half as long as inner. The specimens received from Mr. M. N. Elrod were drawn by means of an old-fashioned windlass and rope from a well in Orleans, Ind., in April and May. They occurred more abundantly in the well which was most frequently used. They would seem to be quite abundant in the wells which evidently connect with subterranean streams.

EUPHILOSCIA, nov. gen.

Two specimens of a pill bug or "sow bug" allied to the British *Philoscia muscorum* and a New England species were found by Mr. Elrod in the same caves and under the same stones as the *Anopthalmus tenuis* and *Platynus marginatus*, about five hundred and fifty feet from the entrance to the cave, and not more than twenty feet from the water in which blind fish (Amblyopsis) occurred. It was afterwards found by Mr. Elrod outside of the cave, in drift wood and under decaying rubbish. The genus Euphiloscia differs from Philoscia in the flagellum of the outer antennæ being subdivided into fifteen joints, while it is no longer than in the latter genus. The second and third joints are rather short; the inner (and smaller) antennæ are very much larger. The body is longer and slenderer, and the abdomen much longer and wider in proportion to the rest of the body, being large and rounded, not mucronate. Uropoda much longer and slenderer than in Philoscia, being as long as the basal abdominal segment is wide; they are subequal. Eyes larger than in Philoscia. In the form of the legs and the setæ this genus more closely resembles Philoscia than Philougria, and is in some respects intermediate between the two genera.

Euphiloscia Elrodii, n. sp. Having no other species with which to compare my two specimens of this species, I can only remark that it is of the usual color of the species of Philoscia found running about in moss, and the cave specimens had not been altered by their subterranean life. The eyes are dark as usual, while the body is mottled with brown and carneous, with no well marked dorsal streak.

Length, ·30 inch, not including antennæ and stylets.

This species is dedicated to M. N. Elrod, Esq., to whom we are indebted for so much new information concerning our cave fauna. One of the cave specimens is larger and the eyes as well developed as in those found outside, near the mouth of the cave.

Cauloxenus stygius Cope. Found attached to an Amblyopsis in the same manner as described by Prof. Cope. From a cave in Bradford, Orleans Co., Ind., by Dr. John Sloan, who had the fish and its parasite alive in an aquarium for nearly a year.

RECORD

OF

AMERICAN ENTOMOLOGY,

FOR THE YEAR 1872.

EDITED BY

A. S. PACKARD, Jr.

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RECORD OF AMERICAN ENTOMOLOGY

FOR THE YEAR 1872.

HYMENOPTERA.

C. A. **Blake** (Trans. Amer. Ent. Soc., iv, 71). Additions to the "Synopsis of North American Mutillidæ."

E. **Norton** (Trans. Amer. Ent. Soc., iv, 77). Notes on North American Tenthredinidæ, with descriptions of new species.

E. T. **Cresson** (Trans. Amer. Ent. Soc., iv, 29). Synopsis of the North American species belonging to the genera *Leucospis*, *Smicra* and *Chalcis*.

E. T. **Cresson** (Trans. Amer. Ent. Soc., iv, 87). Description of a new Species of Masaris, from California.

E. T. **Cresson** (Trans. Amer. Ent. Soc., iv, 153). Hymenoptera Texana. This memoir comprises a list of all the Hymenoptera known to inhabit Texas, except those belonging to the Chrysididæ, Formicidæ and the smaller Chalcididæ. Over six hundred species are enumerated, nearly three hundred of which are new.

E. T. **Cresson** (Canadian Entomologist, iv, 21). Descriptions of North American Hymenoptera, No. 1; p. 61, No. 2; p. 81, No. 3; p. 226, No. 4.

C. V. **Riley**. Fourth Annual Report on the Noxious, Beneficial and other Insects of Missouri, 1872.

S. H. **Scudder** (Amer. Nat., vi, 665). Fossil Insects from the Rocky Mountains. Three species of Hymenoptera are cited.

A. S. Packard, Jr. (Memoirs of the Peabody Academy of Science, III). Embryological Studies on Hexapodous Insects. In this paper the author gives an illustrated account of the embryology of *Nematus ventricosus* Klug, and concludes that the development of this, and probably of all the Tenthredinidæ, accords in its main features with that of the honey bee, the differences in the later stages of the embryo being those which distinguish the caterpillar-like form of the saw-fly larvæ from the footless maggot of the bees, and hence of secondary importance.

A. S. Packard, Jr. Second Annual Report on the Injurious and Beneficial Insects of Massachusetts.

APIARIÆ.

E. T. Cresson (Trans. Amer. Ent. Soc., iv, 248) describes as new from Texas *Colletes Texana*, *Sphecodes Texana*, *S. mandibularis*, *Halictus occidentalis*, *H. armaticeps*, *H. Texanus*, *H. bardus*, *H. ornatipes*, *H. impurus*, *H. lusorius*, *H. connexus*, *H. disparilis*, *H. coactus*, *H. stultus*, *H. albitarsis*, *Agapostemon Texanus*, *Andrena reflexa*, *A. Belfragei*, *A. permitis*, *A. melliventris*, *A. verecunda*, *A. imitatrix*, *A. brunniventris*, *A. Texana*, *A. miserabilis*, *A. bipunctata*, *Panurgus æthiops*, *P. albitarsis*, *P. ornatipes*, *P. picipes*, *Osmia Texana*, *O. subfasciata*, *Megachile fortis*, *M. comata*, *M. albitarsis*, *M. disparilis*, *M. amica*, *M. exilis*, *M. facunda*, *M. frugalis*, *M. gentilis*, *M. inimica*, *M. lucrosa*, *M. grandis*, *M. optiva*, *M. nupta*, *M. studiosa*, *M. osmoides*, *M. variolosa*, *Anthidium concinnum*, *Nomada Texana*, *Cœlioxys Texana*, *C. edita*, *C. insita*, *C. scitula*, *Stelis costalis*, *Melecta interrupta*, *Melissodes atripes*, *M. Comanche*, *M. Texana*, *M. rivalis*, *M. intorta*, *M. Belfragei*, *M. intermedia*, *M. honesta*, *M. pygmæa*, *M. enavata*, *M. spissa*, *M. brevicornis*, *M. albata*, *M.? ursina*, *M.? densa*, *M.? marginella*, *Anthophora Texana*, *Xylocopa Texana*, *X. purpurea*, *Centris lanosa* and *Apathus variabilis*.

VESPIDÆ.

E. T. Cresson (Trans. Amer. Ent. Soc., iv, 87) describes as new *Masaris Edwardsii* from California.

E. T. Cresson (Trans. Amer. Ent. Soc., iv, 232) describes as new *Eumenes Belfragei*, *E. Bollii*. *Odynerus Texanus*, *O. clusinus*, *O erectus*, *O. designatus*, *O. delicatus*, *O. cultus*, *O. verus*, *O. ductus*, *O. fusus*, *O. firmus*, *O. geminus*, *O. manifestus*, *O. colon*, *O. fundatus*, *O. austrinus*, *O. bellulus*. *O. electus*, *Pterochilus Texanus*, *P. laticeps*, *Polistes perplexus*, *P. generosus*, *P. Texanus*, *P. bellicosus* and *P. variatus* from Texas.

CRABRONIDÆ.

E. T. Cresson (Trans. Amer. Ent. Soc., iv, 226) describes as new *Crabro Texanus*, *Mimesa tibialis*, *Cerceris mimica*, *C. gnara*, *C. firma*, *C. morata*, *C. fasciola* and *C. jucunda* from Texas.

NYSSONIDÆ.

E. T. CRESSON (Trans. Amer. Ent. Soc., iv, 222) describes as new *Stizus Texanus*, *S. fervidus*, *Nysson Texanus*, *N.? inerme*, *Gorytes Belfragei*, *G. costalis*, *G. Bollii* and *Alyson Texanus* from Texas.

BEMBICIDÆ.

E. T. CRESSON (Trans. Amer. Ent. Soc., iv, 218) describes as new *Bembex nubilipennis*, *B. Texana*, *B. Belfragei*, *Monedula formosa* and *Monedula neglecta* from Texas.

LARRIDÆ.

E. T. CRESSON (Trans. Amer. Ent. Soc., iv, 213) describes as new *Larrada Americana*, *L. Texana*, *L. Belfragei*, *Tachytes elongatus*, *T. validus*, *T. sericatus*, *T. obscurus*, *T. Texanus*, *T. rufo-fasciata*, *Astata rufiventris* and *A. terminata* from Texas.

SPHEGIDÆ.

E. T. CRESSON (Trans. Amer. Ent. Soc., iv, 209) describes as new *Ammophila grossa*, *A. inepta*, *Pelopæus Texanus*, *Sphex abdominalis*, *S. rufiventris*, *S. Texana*, *S. Belfragei*, *S. lauta*, *S. dubitata* and *Priononyx brunnipes* from Texas.

POMPILIDÆ.

E. T. CRESSON (Trans. Amer. Ent. Soc., iv, 202) describes as new from Texas *Priocnemis Heiligbrodtii*, *P. Texanus*, *P. facetus*, *Agenia Belfragei*, *A. longa*, *Parapompilus vicinus*, *P. Texanus*, *P. contiguus*, *Notocyphus dorsalis*, *N. Texanus*, *Planiceps feralia*, *Aporus minimus*, *A. rufiventris*, *Ceropales Texana*, *Ceropales elegans* and *C. fulvipes*.

SCOLIADÆ.

E. T. CRESSON (Trans. Amer. Ent. Soc., iv, 200) describes as new *Myzine dubiosa*, *M. Texana*, *M. rufiventris* and *Elis lupina* from Texas.

MUTILLIDÆ.

C. A. BLAKE (Trans. Amer. Ent. Soc., iv, 71) describes as new *Mutilla Clotho*, *M. Leda*, *M. Chiron*, *M. Creon*, *M. Admetus*, *M. albopilosa*, *M. grandiceps*, *M. Electra*, *Agama Aulus*, *A. minuta*, *A. juxta* and *A. attenuata* from Texas.

DORYLIDÆ.

E. T. CRESSON (Trans. Amer. Ent. Soc., iv, 194) describes as new *Labidus nigrescens* and *L. minor* from Texas.

ICHNEUMONIDÆ.

E. T. CRESSON (Trans. Amer. Ent. Soc., iv, 153) describes as new from Texas *Ichneumon Belfragei*, *I. propitius*, *Cryptus laticeps*, *C. exulans*, *C. albicollaris*, *C. sororius*, *C. buccatus*, *C. Comalensis*, *Joppidium rubriceps* (Walsh MS.), *J. apicale*, *Phygadeuon Texanus*, *P. intermedius*, *P. timidus*, *Hemiteles conspicuus*, *Mesostenus introitus*, *M. discoidalis*, *M. paludatus*, *M. dejectus*, *M. pertinax*, *M. arvalis*, *M. longicaudis*, *Pimpla* *sanguinipes*, *P. petulca*, *P. animosa*, *Mesoleptus bicoloratus*, *M. delicatus*, *M.? strigosus*, *M.? rotundiceps*, *M.? stigmaterus*, *Exochodes Texana*, *Exochus evectus*, *E. Texanus*, *Metopius Hagenii*, *Exetastes bioculatus*, *Trachynotus Texanus*, *Anomalon magniceps*, *A. pallitarse*, *A. orbitalis*, *A. melleum*, *Mesochorus uniformis*, *M. electilis*, *Campoplex expertus*, *C. bellus*, *Limneria corrupta*, *L. illepida*, *L. infesta*, *L. fura*, *L. rivalis*, *Charops tibialis*, *Porizon audax*, *P. orbitalis*, *P. hyalinipennis*, *P. stigmaterus*, *P. facilis*, *P. macer*, *P.? agilis*, *P.? delicatus*, *Cremastus piceus*, *Eiphosoma Texana*, *Pharsalia* (nov. gen.) *Texanas*—(Braconidæ), *Opius brunneiventris*, *Eubadizon maculiventris*, *Phylax melleus*, *Macrocentrus nuperus*, *M. delicatus*, *Helcon Texanus*, *Ichneutes abdominalis*, *Sigalphus Texanus*, *Chelonus Texanus*, *C. electus*, *C. connectens*, *C. cautus*, *C. laticinctus*, *C. minimus*, *Microdus thoracicus*, *M. Texanus*, *M. nigriceps*, *M. verticalis*, *M. pygmæus*, *Ischius læviventris*, *Agathis exoratus*, *A. meabilis*, *A. rubripes*, *Microgaster croceipes*, *M. maculipennis*, *Bracon epicus*, *B. rugiceps*, *B. simplex*, *B. orbatalis*, *B. radiatus*, *B. faustus*, *B. disjunctus*, *B. mavoritus*, *B. Belfragei*, *B. novitus*, *B. Texanus*, *B. nuperus*, *B. minimus*, *Rogas molestus*, *R. graphicus*, *R. mandibularis*, *R. atricornis*, *R. delicatus*, *R. pilosus*, *Exothecus atriventris*, *E. rugulosus*, *Hormius? aciculatus*, *Megischus Texanus*, *Dacnusa læviceps* and *D. minima*.

E. T. CRESSON (Can. Ent., iv, 21, 61, 81, 226) gives a synopsis of *Mesochorus* and describes as new *M. atriventris* from Ill.; *M. luteipes*, N. J.; *M. basalis*, Mass.; *M. Americanus*, Penn., Del., Ill; *M. Totonacus*, Orizaba, Mex.; *M. scitulus*, *M. obliquus*, *M. melleus*, Penn.; and redescribes *M. agilis* Cresson, Col.; *M vitreus* Walsh, Ill. On p. 61 he describes as new *Pezomachus Pettitii*, Ontario, Can.; *P. gentilis*, Penn.; *P. tantillus*, *P. meabilis*, Ill.; *P. obscurus*, N. J.; *P. Canadensis*, Ontario, Can.; *P. compactus*, Ill.; *P. dimidiatus*, Mass., Ill.; *P. gracilis*, *P. macer*, Penn.; *P. alternatus*, Ill.; *P. Texanus*, Tex.; *P. unicolor*, Del., Mass., Ill. On p. 81 he describes as new *Perilitus niveitarsis*, Mass.; *P. pallitarsis*, N. J.; *P. communis*, Conn., N. J.; *P. intermedius*, Mass.; *P. proximus*, Ill.; *P. vulgaris*, Ill., Tex.; *P. dimidiatus*, N. J., Penn., Ill., Ariz.; *P. humilis*, Ill. On p. 226 he describes as new *Microctonus agilis*, *Euphorus sculptus*, Ill.; *E. mellipes*, N. J., Ill.; *E. scitulus*, Ill.; *Leiophron lævis*, Can.; *Calyptus major*, Can., Va., Ill.; *C. rotundiceps*, Ill.; *C. tibiator*, N. J.; *C. Mexicanus*, Orizaba, Mex.; *Eubadizon lateralis*, Ill.; *E. pleuralis*, Mo.; *E. Americanus*, N. J.; *Ichneutes bicolor*, Mass., and *I. fulvipes*, Ill.

C. V. RILEY (Report Ins. Mo., 43) describes as new *Perilitus indagator*, a parasite on *Acrobasis juglandis* LeBaron. On p. 110 he describes *Cryptus extrematis* Cress.

B. P. MANN (Amer. Nat., vi, 599) describes and figures as new *Bracon letifer* from Brazil, a parasite of *Cemiostoma coffeellum*.

PROCTOTRUPIDÆ.

E. T. CRESSON (Trans. Amer. Ent. Soc., iv, 193) describes as new from Texas *Dryinus atriventris*, *Gonatopus? alatus*, *Epyris læviventris*, *E. analis*.

CHALCIDIDÆ.

C. V. RILEY (Report Ins. Mo., 109) describes *Chalcis mariæ* Riley.

B. P. MANN (Amer. Nat., vi, 598) describes as new *Eulophus cemiostomatis* from Brazil, a parasite of *Cemiostoma coffeellum*.

E. T. **Cresson** (Trans. Amer. Ent. Soc., iv, 29) gives a synopsis of the American species of Leucospis, describing as new *L. bulbiventris*, *L. apicalis*, *L. Mexicana*, *L. Sumichrastii*, Mex.; *L. Texana*, Tex.; *L. Poeyi*, Cuba; *L. affinis* var. *Floridana*, Fla.; *L. Azteca*, *L. dubiosa*, *L. Tolteca*, Mex. Also a synopsis of the American species of Smicra, and describes as new *S. Canadensis*, Can.; *S. flebilis*, Mass.; *S. rufofemorata*, Tex.; *S. delumbis*, Mass., Del.; *S. torvina*, Mass., Conn., Ill., Tex.; *S. delira*, *S. mendica*, *S. subobsoleta*, Tex.; *S. Toluca*, *S. Mexicana*, Mex.; *S. sanguiniventris*, *S. bioculata*, Tex.; *S. lecta*, *S. ambigua*, Mex.; *S. arcana*, Del.; *S. lauta*, Mex.; *S. Nortonii*, D. C.; *S. coxalis*, Del.; *S. encausta*, Col.; *S. barbara*, *S. coccinata*, *S. flammeola*, *S. miranda*, Mex.; *S. dorsata*, Tex.; *S. exornata*, *S. compactilis*, *S. Azteca*, *S. lenta*, *S. Tolteca*, Mex.; *S. mirabilis*, Ga., Tex.; *S. juxta*, Mex.; *S. delicata*, Tex. Also a synopsis of the American species of Chalcis, and describes as new *C. tegularis*, Tex.; *C. Coloradensis*, Col., and *C. pedalis*, Tex.

P. S. **Sprague** (Proc. Bost. Soc. Nat. Hist., xiv, 388) announces that he has reared *Pteromalus puparum* from *Pieris rapæ*.

A. S. **Packard**, Jr. (Second Ann. Rep. Ins. Mass., 8) describes the habits and transformations (with figures) of *Pteromalus puparum* Linn.

CYNIPIDÆ.

F. G. **Sanborn** (Proc. Bost. Soc. Nat. Hist., xiv, 140) notes the occurrence of *Cynips quercus-tubicola* O. Sacken and *C. quercus-lanæ* Fitch in the Cumberland Mts., Alabama.

TENTHREDINIDÆ.

E. **Norton** (Trans. Amer. Ent. Soc., iv, 77) describes as new *Ptenos* (nov. gen.) *Texanus*, *P. niger*, *P. nigropectus*, Tex.; *Hylotoma McLeayi*, Conn.; *H. consobrina*, Mex.; *Cladius æqualis*, Conn.; *Pachylota varicolor*, Mex.; *Emphytus Bollii*, Tex., *Dictynna Cordoviensis*, *D. politus*, Mex.; *Hemichroa albidovariata*, *H. fraternalis*, Tex.; *Dolerus similis* var. *Yukonensis*, Alaska; *D. distinctus*, *D. coccinifera*, Cal.; *Selandria Sumichrasti*, *S. longipennis*, *S. fascipennis*, Mex.; *S. inæquidens*, *S. albicollis*, Tex.; *S. coccinata*, Mex.; *Lophyrus fulva*, Tex.; *Cephus cinctus*, Col., and *Xyela ænea*, Tex.

A. S. **Packard**, Jr. (Second Ann. Rep. Ins. Mass., 15) gives an account (with figures) of the habits of *Selandria rubi* Harris.

LEPIDOPTERA RHOPALOCERA.

C. J. S. **Bethune** (Report of the Ent. Soc. of Ontario, for 1871, p. 82). Insects affecting the cabbage.

C. J. **Bowles** (Can. Ent., iv, 102). Notes on *Pieris rapæ*.

A. G. **Butler** (Trans. Ent. Soc., London, 1871, p. 169). Descriptions of New Species of *Pierinæ*.

A. G. **Butler** (Proc. Zool. Soc., 1872, p. 26). A synonymic List of the species included formerly in the genus *Pieris*.

A. G. **Butler** (Cistula Entomologica, iv). Description of new Butterflies from Costa Rica.

Wm. **Couper** (Can. Ent., iv, 201). Remarks on Lepidoptera collected at Fox Bay, Anticosti, and the north shore of the St. Lawrence, between June 18 and Aug. 1, 1872.

G. M. **Dodge** (Can. Ent., iv, 217). A new Hesperian.

G. M. **Dodge** (Can. Ent., iv, 240). Note on *Pieris vernalis*.

W. H. **Edwards**. The Butterflies of North America. Part 10 and the Supplement of this magnificent work have been issued during the year, concluding the first volume.

W. H. **Edwards** (Hayden's Report, Geol. Surv. Montana and adjoining territory, 1871, p. 466). List of Butterflies collected by the Expedition in 1871. (Includes 31 species.)

W. H. **Edwards** (Trans. Am. Ent. Soc., iii, 205). Description of New Species of Diurnal Lepidoptera of the United States.

W. H. **Edwards** (*ibid.*, iv, 61). Description of New Diurnal Lepidoptera of the U. S.

W. H. **Edwards** (*ibid.*, iii, 266). New Species of North American Butterflies.

W. H. **Edwards** (Can. Ent., iv, 238). Notes on some Butterflies and their Larvæ.

A. R. **Grote** (Can. Ent., iv, 220). Note on *Hesperia communis* Gr.

A. R. **Grote** (*ibid.*, 215). On Mr. Scudder's Systematic Revision of North American Butterflies.

W. C. **Hewitson** (Trans. Ent. Soc., London, 1871, p. 165). New Species of Diurnal Lepidoptera from South and Central America.

J. M. **Jones** (Proc. and Trans. Nova Scotian Inst. Nat. Sciences, iii, 18 and 100). On Nova Scotian Diurnal Lepidoptera. (A list of the Butterflies of Nova Scotia, with notes on their habits, etc.)

J. A. Lintner (Twenty-third and twenty-fourth Ann. Rep's N. Y. State Cabinet of Nat. Hist., for 1869 and 1870). Entomological Contributions, Nos. 1 and 2. Contains catalogues of the appearance of different species of butterflies, for 1869 and 1870, and a list of those found in New York, besides notes and descriptions noticed below.

Theo. L. Mead (Can. Ent., iv, 216). Description of a remarkable variety of *Limenitis Misippus.*

Chas. S. Minot (Can. Ent., iv, 150). Notes on *Limochores bimacula* Scudd.

L. Mitchell (Am. Naturalist, vi, 238). Life of *Danais Archippus.*

H. W. Parker (Am. Naturalist, vi, 115). Butterfly Notes, 1871.

H. W. Parker (*ibid.*, 116). Iowa Butterflies.

W. Saunders (Can. Ent., iv, 121). Notes on *Argynnis Cybele.*

W. Saunders (*ibid.*, 161). Notes on the Eggs and young Larvæ of *Melitœa Harrisii.*

S. H. Scudder (Fourth Rep. Peab. Acad. Sciences, p. 24). A Systematic Revision of some of the American Butterflies, with brief notes on those known to occur in Essex Co., Mass. (The genera are all described,.except those of Hesperidæ. Mr. Scudder follows the "rule of priority" strictly in the nomenclature of species and larger groups. The new species and genera described are referred to below).

S. H. Scudder (Can. Ent., iv, 45). Embryonic Larvæ of Butterflies. (Reprint from the Ent. Monthly Mag. See this Record for 1871).

S. H. Scudder (*ibid.*, iv, 73). Abbot's Notes on Georgian Butterflies. (Copied from Abbot's drawings in the British Museum.)

S. H. Scudder (*ibid.*, iv, 79). A variety of *Pieris* (*Ganoris*) *rapœ*, unknown in Europe.

S. H. Scudder (Am. Naturalist, vi, 513). The Curious History of a Butterfly.

NYMPHALIDÆ.

A. G. BUTLER (Cist. Ent., iv) describes as new *Drucina Leonata* gen. et. sp. nov.; *Oxeoschistus Euriphyle*, *Dynastor Styianus*, *Caligo bubocula*, *Morpho Aquarius*, *M. marinita*, *M. limpida*, *M. hydorina*, *Epiphile grandis*, *Heterochroa demialba*, *Phyciodes fulviplaga*, *Eresia dismorphina* from Costa Rica.

W. H. EDWARDS (Butt. N. A. Pt. 10 and Suppl.) describes and figures *Grapta Satyrus* and *G. Zephyrus*, n. sp.; refigures *Argynnis Diana* and *A. Nokomis* and *A. Leto*, and redescribes *Apatura Alicia* and *Melitœa Chalcedon*.

W. H. EDWARDS (Trans. Am. Ent. Soc., iii, 266) describes as new *Argynnis Helena*, *Phyciodes camillus*, *P. Emissa*, *Erebia Rhodia* and *E. Callias* all from Colorado.

W. H. EDWARDS (Trans. Am. Ent. Soc., iii, 205) describes as new *Phyciodes Orscis*, *P. Canace* from Cal.; *Euptychia rubricata*, Tex.; and *Cœnonympha Ampelos* from Oregon.

W. H. EDWARDS (*ibid.*, iv, 61) describes the following new species, *Argynnis Bremnerii*, San Juan Isl.; *A. inornata*, *A. Eurynome*, *A. Meadii*, *Grapta Hylas*, *Satyrus Charon* and *Erebia Meadii* from Cal.

W. H. EDWARDS (Can. Ent. iv, 238) gives notes of an attempt to raise the larvæ of *Argynnis Aphrodite* and *Cybele*.

W. H. EDWARDS (Hayden's Rep. Geol. Surv., Montana, 1871, p. 467) describes as new *Erebia Haydenii* from the Yellowstone.

J. A. LINTNER (23d Ann. Rep. N. Y. State Cabinet Nat. Hist., Appendix D., p. 154) describes the egg and larval stages of *Melitœa Phaeton*, and the larva and pupa of *M. Nycteis*.

THEO. L. MEAD (Can. Ent. iv, 216) describes a variety of *Limenitis Misippus* in which the black cross band on the wings is nearly obsolete, and which therefore resembles more closely *D. Archippus*; also a variety, or perhaps a hybrid, of *L. Ursula*.

L. MITCHELL (Am. Nat. vi, 238) notes the duration of the life of *Danais Archippus*, imago, in captivity, the greatest length of life being forty days.

W. SAUNDERS (Can. Ent., iv, 121) describes the larva and pupa of *Argynnis Cybele*; and (*ibid.*, 161) describes the eggs and young larvæ of *Melitœa Harrisii*.

S. H. SCUDDER (4th Ann. Rep. Peab. Acad. Science, p. 24) describes the genera of American Nymphalidæ, restoring the oldest names as far as possible to both genera and species, and giving notes on the habits, immature stages, etc., of many of those species found in Essex Co., Mass. The following new genera are described; *Basilarchia*, including *Disippe*, *Astyanax* (= *Ursula*) and *Arthemis*: *Speyeria*, for *Idalia*: *Charidryas*, for *Nycteis* and *Ismeria*: *Limnœcia*, for *Harrisii*: *Euphydryas*, for *Phaeton*.

S. H. SCUDDER (Am. Nat. vi, 513) describes the curious phenomena presented by the broods of *Argynnis* (*Brenthis*) *Bellona*.

ERYCINIDÆ.

W. H. EDWARDS (Trans. Am. Ent. Soc. iii, 205) describes *Charis Nemesis*, sp. nov., from Arizona.

W. C. HEWITSON (Trans. Ent. Soc. London, 1871, 165) describes *Eurygona argentea*, sp. nov., from Nicaragua.

S. H. SCUDDER (4th Rep. Peab. Acad. Sci., 49) characterizes *Polystichtis* Hübn., in which genus he places *Charis borealis* Grote and Rob.

LYCÆNIDÆ.

A. G. Butler (Cist. Ent., iv) describes as new *Pandemos nymphidioides* and *Lemonias Adelina*, from Costa Rica.

W. H. Edwards (Trans. Am. Soc. Ent., iii, 266) describes as new *Chrysophanus Sirius* and *Thecla Ninus*, from Colorado; *T. Autolytus* and *Lycæna Alcestis*, from Texas; *L. Daunia*, *L. Alce*, *L. Lycea* and *L. rustica*, from Colorado.

W. H. Edwards (*ibid.*, iii, 205) describes as new *Thecla Cygnus*, Nevada; *T. costalis*, Texas; *Lycæna Helios* and *Viaca*, Cal.; *L. Ardea* and *Glaucon*, Nevada; *L. Gyas*, Ariz.; *L. Fea*, Tex.; *Chrysophanus Ianthe*, Nevada.

S. H. Scudder (4th Rep. Peab. Acad. Sci., 50) describes the American genera of the family, including *Callipareus* gen. nov., for *Thecla humuli* (*Melinus*); *Mitouri*, for *Auburniana* (=*smilacis*); *Incisalia* (Minot, MSS.), for *Niphon*, *Augustus* and *Irus* (=*Henrici*); *Erora*, for *læta* (=*Clothilde*); *Glaucopsyche*, for *Lyc. Pembina* Edw.

PAPILIONIDÆ.

C. J. S. Bethune (Rep. Ent. Soc., Ontario, Can., 1871, p. 52) describes the cabbage butterflies, *P. rapæ*, *oleracea* and *Protodice*.

C. J. Bowles (Can. Ent. iv, 102) discusses the appearance and spreading of *Pieris rapæ;* and states that the yellow variety of the species has been known in Europe.

A. G. Butler (Trans. Ent. Soc. Lond., 1871, 169) describes and figures *Kricogonia Fantasia* n. sp., from Nicaragua; and describes *Euchloë Limonea* n. sp., Mexico.

A. G. Butler (Proc. Zool. Soc., 1872, 26) gives a list of the species of *Pieris* (*sensu lat.*), distributing the American species among the genera *Mylothris*, *Hesperocharis*, *Leptophobia*, *Pieris*, *Daptonura*, *Pontia*, *Synchloë*. No new species described.

G. M. Dodge (Can. Ent., iv, 240) records the capture of two males of *Pieris vernalis*, in Oct. 16 and 19, 1872, which he thinks militates against this form being the spring brood of *P. Protodice*.

W. H. Edwards (Butt. N A., Part 10 and Suppl.) describes and figures *Parnassius Smintheus* in its three varieties *Sayii*, *Behrii* and *Eversmanii*. Also tabulates the differences between *P. clarus* and *P. Clodius*.

W. H. Edwards (Tr. Am. Soc. Ent., iii, 266) describes as new *Anthocharis Olympia*, Tex.; and *Colias Meadii*, U. S.

W. H. Edwards (*ibid.*, 205) describes *Anthocharis Hyantis* sp. nov., from Cal.

W. H. Edwards (*ibid.*, iv, 61) describes *Colias Astræa* sp. n., Yellowstone; *Anthocharis Julia* n. sp., Col., also *Neophasia Menapia*, Feld. ♀.

J. A. Lintner (Rep. N. Y. State Mus. Nat. Hist., 1870, 109) records the first appearance of *Pieris rapæ* in Albany, July 24, 1870.

J. A. Lintner (*ibid.*, for 1869, 158) describes eggs and larvæ of *Pieris oleracea*.

S. H. Scudder (4th Rep. Peab. Acad. Sci., 58) characterizes the American genera of the family.

S. H. Scudder (Can. Ent. iv, 79) describes the yellow variety *Pieris* (*Ganoris*) *rapæ*, which he names *Novangliæ* Scudd., and states that it is unknown in Europe. (See notes by Mr. Bowles, recorded above.)

A. G. Butler (Cist. Ent., iv) describes as new *Euterpe diamorphites*, *Catasticta Actinotis*, *Mylothris Alethina*, *Callidryas intermedia*, *Dismorphia Sororna*, *D. Hogaresa*, *D. lubina*, *D. viridifascia*, *Papilio orabilis*, *P. Lætitia*, *P. vulneratus* and *P. Clusoculis*, from Costa Rica.

HESPERIDÆ.

G. M. Dodge (Can. Ent., iv, 217) describes *Hesperia Illinois*, n. sp., from Bureau Co., Ill.

W. H. Edwards (Trans. Am. Ent. Soc., iii, 266) describes as new *Thymeticus Hylax*, *Pamphila Draco*, from Col.; *P. Licinus*, *P. Attalus* and *Hesperia Horus* and *H. Eos*, from Texas; *H. Dakota*, from Col. (*ibid.*, 205) *Syrichtus Oceanus*, Arizona; *Stercoptes Skada*, Kodiak; *Heteropterus Arene*, Arizona; *Hesperia Procris*, *H. Tamenund*, Texas; and *H. Ophis*, from Florida.

A. R. Grote (Can. Ent., iv, 220) states that *Hesperia communis* Gr. is identical with *H. tessellata*, Scudd.

W. C. Hewitson (Tr. Ent. Soc. Lond., 1871, 165) describes as new *Pyrrhopyga Crida*, from Nicaragua.

J. A. Lintner (24th Rep. N. Y. State Mus. Nat. Hist., 1870, 109) gives notes on the habits of *Nisoniades Lucilius*.

J. A. Lintner (*ibid.*, 23d Rep., 1869, 162) describes and figures *Nisoniades Icelus* Lint., *N. Lucelius* Lint., and *N. Ausonius* n. sp.

C. S. Minot (Can. Ent., iv, 150) describes the male of *Limochores bimacula* Scudd. (=*Hesp. Acanootus*).

S. H. Scudder (4th Rep. Peab. Acad. Sci., 67) gives a list of the American Hesperidæ, and names, but does not describe, thirty-two new genera. The following new species are described; *Pyrrhopyga Venezuelæ*, Venezuela; *P. chalybea*, Mex.; *Dysenius cruentus*, gen. et sp. nov., Gautemala; *Erycides Texana*, *E. sanguinea*, Texas; *Thymele vitreus*, Venezuela; *T. Sumichrastii*, Tehuantepec; *T. Domingo*, Hayti; *T. Montezuma*, Tehuantepec; *Epargyreus Orizaba*, Gautemala; *Thorybes* gen. nov., *Nevada*, Cal.; *Pholisora* gen. nov. *Azteca*, Mex.; *Leucoscirtes* (gen. nov.), *nivea*, Tehuantepec, Gautemala; *Hesperia tessellata*, Penn , Md., Ia., Fla., Ala., Tex., Mo. and Cal.; *Callimorphus juventus*, gen. et sp. nov., Panama; *Potanthus Californicus*, gen. et sp. nov., Cal.; *Amblyscirtes Tolteca*, gen. et sp. nov., Tehuantepec; *Ocytes Seminole*, gen. et sp. nov., Fla. to Tex.; *Pamphila Columbia*, Cal.; *Ochlodes Sonora*, gen. et sp. n., Cal.; *Hedone*, gen. nov. *præceps*, Tehuantepec; *Orono*, northern states; *Lerodea Inca* gen. et. sp. nov., Peru.; *Phrenes Hecobolus* gen. et. sp. nov., Tehuantepec; *Perichares marmorata* gen. et. sp. nov., Venezuela; *Lerema Pattenii* gen. et. sp. nov., Gautemala.

A. G. Butler (Cist. Ent., iv) describes as new *Carystus gemmatus*, from Costa Rica.

LEPIDOPTERA HETEROCERA.

R. H. Stretch. Illustrations of the Zygænidæ and Bombycidæ of North America. Vol. i, parts 1–7, with colored plates. In this important work the author figures all the species and sometimes remarkable varieties of these two families to which he has access, with interesting remarks on the habits and transformations of several of the Californian species. He also notices the extreme tendency to variation in Californian Lepidoptera. We shall merely notice the original matter. This deserves mention as being the first entomological work printed, illustrated and published in California.

B. CLEMENS. The Tineina of North America, being a collected edition of his writings on that group of insects, with notes by the editor, H. T. Stainton, London, 1872, 8vo, pp. 282. We shall only refer to certain unpublished matter contained in this valuable reprint, and to Mr. Stainton's unpublished notes. The work contains several unpublished woodcuts of venation.

J. A. LINTNER. Entomological Contributions (Appendix to 23d Ann. Report N. Y. State Cabinet of Natural History, for the year 1869, published 1872). This part contains the following articles on Heterocera: Biography of *Hemileuca Maia* (Drury); Description of a new Sphinx; List of Sphingidæ occurring in the State of New York; Dates of Collection of New York Heterocera; List of North American Lepidoptera contained in "Species Général des Lépidoptères par A. Guenée;" Notes on *Cucullia intermedia* Speyer.

The same, No. II (from the 24th Ann. Report, etc., for the year 1870, published in 1872), contains articles on the following subjects relating to the Heterocera: On the Larva and Imago of *Sesia diffinis* Harris; Transformations of *Sesia Buffaloensis* Gr.-Rob.; On the Larva and Pupa of *Thyreus Abbotii* Swainson; On the Larva of *Philampelus Achemon* (Drury); *Smerinthus geminatus* Say, and its supposed varieties; Transformations of *Daremma undulosa* Walk.; Notes on *Platarctia Parthenos* (Harr.); Notes on *Euprepia Americana;* Notes on *Euchætes Egle* (Drury); Transformations of *Lagoa crispata* Pack.; Transformations of *Hyperchiria Io* (Fabr.); Transformations of *Eacles imperialis* (Drury); Larval Notes on *Anisota senatoria* (Smith); Dates of Collection of some Heterocera for 1870.

A. **Speyer** (Entomological Contributions, by J. A. Lintner, I). On *Cucullia intermedia*, n. sp., and *C. lucifuga* W. V.

A. R. **Grote** and C. T. **Robinson** (Trans. Amer. Ent. Soc. iii, 176). Description of North American Lepidoptera, No. 5.

A. R. **Grote** (Trans. Amer. Ent. Soc. iv, 1). On the North American species of Catocala.

A. R. **Grote** (Trans. Amer. Ent. Soc. iv, 20). Descriptions of North American Noctuidæ, No. 1, p. 89, No. 2.

H. **Strecker**. Lepidoptera, Rhopaloceres and Heteroceres, indigenous and exotic; with descriptions and colored illustrations. 4to, one plate.

C. V. **Riley**. Fourth Annual Report on the Noxious, Beneficial and other Insects of Missouri.

W. **LeBaron**. Second Annual Report on the Noxious Insects of Illinois.

The Abbe **Provancher**; editor of Naturaliste Canadien.

T. **Glover** (Monthly Report of the Department of Agriculture). Entomological Record.

A. S. **Packard**, Jr. (Fourth Ann. Rep. Peabody Acad. Science). New North American Moths; Zygænidæ and Bombycidæ.

Lord **Walsingham** (American Naturalist, vi, 275). Directions for collecting Microlepidoptera.

B. P. **Mann** (American Naturalist, vi, 332, 596). The White Coffee Leaf Miner.

SPHINGIDÆ.

J. A. **Lintner** (Ent. Contr., i) describes as new *Ellema pineum* (Pl. 8, figs. 12 ♂, 13 ♀). On p. 40 he gives a list of Sphingidæ occurring in the State of New York. In No. 2 he describes the transformations of *Sesia diffinis* Harr., *S. Buffaloensis* G. and R., *Thyreus Abbotii* Swain., *Philampelus Achemon* (Drury), *Smerinthus geminatus* Say and its supposed varieties, and *Daremma undulosa* Walk.

A. R. **Grote** (Trans. Amer. Ent. Soc., iii, 184) describes as new *Aellopus Blainii* from Cuba.

ZYGÆNIDÆ.

R. H. **Stretch** (Ill. Zygænidæ and Bombycidæ N. A.) gives a synopsis of the twelve known species of *Alypia*, and describes as new from California *Alypia Brannani* (Pl. 1, fig. 8 ♂); *A. similis* (Pl. 1, fig. 5 ♀): *A. lunata* (Pl. 1, fig. 6 ♀). On p. 22 he states that *Scepsis Packardii* Grote is a synonyme of *S. fulvicollis* (Hübn.). On p. 25 he gives a synopsis of the species of *Ctenucha*, and describes as new from California *Ct. brunnea*. On p. 147 he tabulates the three species of *Eudryas*, and describes as new *E. brevipennis* (Pl. 7, figs. 3, 4) Cal.

A. S. PACKARD, Jr. (4th Rep. Peab. Acad. Sci.) describes as new *Lycomorpha miniata* from South California and *L. Palmerii* from Arizona.

BOMBYCIDÆ.

R. H. STRETCH (Ill. Zyg. and Bomb. N. A.) gives a synopsis of the species of *Cisthene*. He says "it seems not unlikely" that *Euphanessa mendica* must be removed to the Geometridæ, as the larva has been found by Mr. Saunders to be a geometer, having but two pairs of prop legs. On p. 58 he discusses the limits of the species of *Utetheisa*. He then gives a synopsis of the species of Callimorpha. *Kodiosoma* is characterized as new, and *K. fulva*, n. sp. (Pl. 2, fig. 7), *K. nigra* (Pl. 2, fig. 8) Cal., *K. tricolor* (Pl. 2, fig. 5) Nevada, described from California; *K. Eavesii* (Pl. 2, fig. 6) Nevada, described from California and Nevada. A synopsis of *Arctia* is given on p. 74, with descriptions of the following new species: *A. Behrii* (Pl. 3, fig. 12 ♂, 11 ♀); *A. Bolanderi* (Pl. 3, fig. 13); and *A. Edwardsii* (Pl 3, fig. 9) California. On p. 88 he gives a detailed description of the larva of *Arachnis picta* Pack. On p. 87 he tabulates the species of *Halesidota*, and describes the larva of *H. Edwardsii* Pack. He thinks *Phryganidia* should be removed from the Psychidæ, in which it was placed by Packard, to the Zygænidæ near Procris and Ctenucha, since Heterogynis, its ally, has been removed by many European writers to that group. He describes its larva and pupa. On p. 103 he describes the larva and cocoon of *Halesidota Agassizii* Pack. On p. 135 he describes as new *H. sobrina* (Pl. 6, fig. 10 ♂), Cal. He also describes as new *Sthenopis Behrensii* (Pl. 4, fig. 6) Cal. and *Sthenopis Montana* (Pl. 4, fig. 7), from Cal. On p. 107 he tabulates the four species of *Hemileuca*, and describes as new *H. Nevadensis* (Pl. 4, fig. 10 ♂). Nevada. redescribes *Drepana siculifer* Pack. (Pl. 4, fig. 11 ♀) Cal., *Gastropacha Mildei* (Pl. 4, fig. 12) Cal. On p. 115 he tabulates the species of *Notodonta*, and describes as new *N. Californica* (Pl. 4, fig. 5) Cal., with an account of the larva. On p. 118 he describes as a new genus *Leptarctia*, tabulating the species, and describing as new *L. dimidiata* (Pl. 5, fig.7, 8, 9, 10) Cal. On p. 130 he tabulates the species of *Spilosoma* and describes as new *S. latipennis* (Pl. 6, fig. 5 ♀), probably New York. On p. 144 the ♀ of *Euleucophæus tricolor* Pack., from New Mexico, is described and figured (♂ also).

J. A. LINTNER (Ent. Contr., I) gives an elaborate account of the transformations of *Hemileuca Maia* (Drury, Pl. 8, fig. 1). In No. II he gives an account of the transformations of *Platarctia Parthenos* (Harr.), *Euprepia Americana* (Harr.), *Euchætes egle* (Drury), *Lagoa crispata* Pack., *Hyperchiria Io* (Fabr.), *Eacles imperialis* (Drury), *Anisota senatoria* (Smith).

H. STRECKER (Lepidoptera, etc.) describes and figures *Platysamia Gloveri* n. sp. from Arizona, and notes the distribution of the varieties of *Euchætes egle*.

C. V. RILEY (Fourth Ann. Rep. Ins. Mo.) gives a full account of silk worms, giving the histories, fully illustrated, of *Bombyx mori* (Linn.), *Platysamia Cecropia* (Linn.), *Samia Cynthia* (Drury), *Callosamia Promethea* (Drury), *Arctias Luna* (Linn.), *Telea Polyphemus*

(Linn.), *Antheræa Yama-maï* G.-Menn. and *A. Pernyi* G.-Menn.; also of *Ecpantheria scribonia* Stoll and *Arctia Isabella* Smith.

Provancher (Nat. Can., 283) gives an account of *Samia Columbia* Smith, which he thinks may be only a variety of *S. Cecropia* (Linn.).

A. R. Grote and C. T. Robinson (Trans. Amer. Ent. Soc., iii, 176) describe as new *Vanessodes* (nov. gen.) *clarus*, from Texas, and *Lithosia cephalica*, Texas.

A. R. Grote (Trans. Am. Ent. Soc., iii, p. 187) describes as new *Nelphe coccinipes* from Cuba.

A. S. Packard, Jr. (4th Rep. Peab. Acab. Sci.) describes as new *Cisthene grisea*, *Clemensia umbrata*, *Leucarctia permaculata*, *Drepana siculifer*, from California, and *Hemileuca Juno*, from border of Arizona and Sonora, *Euleucophæus* (nov. gen.) *tricolor*, New Mexico, *Gloveria* (nov. gen.) *Arizonensis*, border of Arizona and New Mexico, and *Gastropacha Californica* Cal. He also notes the occurrence of *Nemeophila petrosa* Walk. in Southern California; refers *Platarctia Scudderii* Pack. to the genus Nemeophila, and regards *Leucarctia Californica* as the same as *L. acræa* (Smith). He also records the occurrence of *Halesidota caryæ* (Harr.) and *Coloradia Pandora* Blake on the border between Arizona and New Mexico.

B. Clemens (Tineina N. Amer. 5) gives an account of the means by which *Attacus Cecropia* effects its delivery from its cocoon.

NOCTUIDÆ.

J. A. Lintner (Ent. Contr. i, 81) gives some notes on the larva of *Cucullia intermedia* Speyer.

A. Speyer (Lintner's Ent. Contr., I, 85) describes as new *Cucullia intermedia* (Pl. 8, figs. 5, 6,) from N. York.

W. LeBaron (2d Ann. Rep. Ins. Ill.) gives an illustrated account of *Gortyna nitela* Guen.

A. R. Grote (Trans. Am. Ent. Soc., iii, p. 183) describes as new *Crino dissimilis* from Cuba.

A. R. Grote (Trans. Amer. Ent. Soc., iv, 1) describes most of the species of Catocala and describes as new *C. retecta* from Middle States. *Catocala flebilis*, *C. coccinata*, *C. habilis*, Penn., *C. abbreviatella*, *C. Frederici*, Texas, *C. lineella*, southeastern states, *C. Robinsonii*, Penn.

A. R. Grote (Trans. Amer. Ent. Soc., iv, 20) describes as new *Hadena* (Mamestra) *badistriga*, Canada, N. Y., *Emmelia* (Agrophila) *apicella*, *Eutoreuma* (nov. gen.) *tenuis*, *Matigramma pulverilinea*, *Pleonectyptera* (nov. gen. of which *Pleon. pyralis* is the type) *P. geometralis*, *P. phalænalis*, central Ala.

A. R. Grote and C. T. Robinson (Trans. Amer. Ent. Soc., iii, 179, Pl. 2) describe as new *Leucania rubripennis*, Texas, *Acronycta dissecta* and *A. Verrilli*, Mass.; *A. luteicoma*, Atlantic district; and *A. funeralis*; *Heliothis citrinellus*, Texas; *Anthœcia Thoreaui*, Atlantic district; *Tarache cretata*, Texas.

PHALÆNIDÆ.

W. LeBaron (2d Ann. Rep. Ins. Ill.) gives an illustrated account of the habits of *Anisopteryx vernata* (Peck).

A. R. Grote and C. T. Robinson (Trans. Amer. Ent. Soc., iii, 182) describe as new *Fidonia fimetaria*, Texas.

PYRALIDÆ.

C. V. **Riley** (Fourth Ann. Rep. Ins. Mo.) gives an account of the habits of *Acrobasis nebulo* (Walsh) with illustrations, and describes as new *Pempelia Hammondi*, and *A. juglandis* LeB. (with fig.).

C. V. **Riley** (Amer. Nat., vi, 765) publishes a note on the fertilization of Yucca by *Pronuba yuccasella*, n. sp.

Herrich-Schaeffer (C. B. Ver. Regensburg, xxv) describes as new from Cuba:—*Asopia tripartitalis*, *Hellula simplicalis*, *Deuterollyta majuscula*, *Botys graminalis*, *B. geminatalis*, *B. germanalis*, *B. episcopalis*, *B. glirialis*, *B. gracilalis*, *B. narpalis*, *B. semifulvalis*, *B. subviolalis*, *B. subaurantialis*, *B. subhyalinalis*, *B. tilieralis*, *B. hesperialis*, *B. idonealis*, *B. dilutalis*, *B. illepidalis*, *B. impeditalis*, *B. impulsalis*, *B. impuralis*, *B. inflxalis*, *B. lualis*, *Phakellura mariannalis*, *Cœnostola quadrifenestralis*, *Lineodes gracilalis*, *L. multisignalis*, *Desmia sertorialis*, *D. impuralis*, *D. quadrinotalis*, *D. personalis*, *D. pervialis*, *Cataclysta minimalis*, and *C. plusialis*.

W. **LeBaron** (2d Ann. Rep. Ins. Ill.) gives an illustrated account of *Acrobasis nebulo* (Walsh) and *A. juglandis* LeB.

T. **Glover** (Ent. Record) gives a brief illustrated notice of *Plutella xylostella* (Linn.), and p. 304, *Anarsia purinella* Clem.

A. R. **Grote** (Trans. Amer. Ent. Soc., iv, 23) describes as new *Hypena toreuta*, middle states, *Renia brevirostralis*. Penn., Ala., *R. larvalis*, Penn., Texas, *R. restrictalis*, Penn., *R. centralis*, West Va., *R. pastoralis*, Penn., *R. Belfragei*. Texas.

In No. 2 he describes as new *Marasmalus ventilator*, N. Y., Mass., *Phyprosopus* (nov. gen.) *callitrichoides*, N. Y., Texas, *Madopa interpuncta* Grote, *Bleptina inferior*, Ala., Texas, *Herminia lævigata*, Penn., Va., West Va., *H. marcidilinea*, Penn., Ala., *H. obscuripennis*, Central Ala., *H. ochreipennis*, West Va., *H.* (subgenus Philometra) *serraticornis*, Penn., Va., *H. longilabris* Penn., Va., *Renia alutalis*, Penn., *R. plenilinealis*, Penn., *Hypena citata*, Alabama, *H. evanidalis*, eastern and middle states, var., *subrufalis* of *H. erectalis* Guen. Atlantic states, *H. sordidula*, Penn., *H. profecta*, Penn., *Tortricodes bifidalis*, N. Y. to Texas, *T. indivisalis*, N. Y., Ala. with new descriptions of previously known species.

TORTRICIDÆ.

C. V. **Riley** (Fourth Rep. Ins. Mo.) gives information of economic value relating to *Carpocapsa pomonella* (Linn.) and describes as new *Tortrix cinderella*, with figures and notes on its habits, and notices the habits of *Tortrix malivorana* LeB.

W. **LeBaron** (2d Ann. Rep. Ins. Ill.) gives a note on *Tortrix malivorana* LeB.

TINEIDÆ.

C. V. **Riley** (Fourth Rep. Ins. Mo.) figures and notices the habits and transformations of *Bucculatrix pomifoliella* Clem. and *Holococera glandulella* Riley.

B. P. **Mann** (Amer. Nat., vi, 332, 596) gives an exhaustive account (with figures) of the habits and transformations of *Cemiostoma coffeellum* of Brazil.

V. T. **Chambers** (Amer. Nat., vi, 489) remarks on the synonymy of certain species of Cemiostoma.

B. **Clemens** (Tineina N. Amer. 8, 16) describes the transformation of *Lithocolletis rabinecella;* p. 19, *Antispila nyssæfaliella;* p. 25 *Phyllacnistis vitigenella;* p. 26 *Aspidisca splendariferella;* p. 34 gives a synopsis of the groups of Tineina.

H. T. **Stainton** (Tineina N. Amer.) gives editional notes on certain N. Amer. moths of this family.

V. T. **Chambers** (Can. Ent., iv) describes as new *Gracilaria upatoriella, G. plantaginisella, G. 12-lineella, G.* (Coriscium?) *albinatella, G. salicifoliella, G. Packardella, G. purpuriella. G. juglandiella, Hyponomeuta euonymella, H. longimaculella, Heribeia? incertella, Anarsia obliqui-strigella, Evagora* (afterwards p. 192 placed in Gelechia) *difficilisella, Parasia apici-strigella, Gelechia tephriasella, G. palpiannulella,* from Kentucky; *Parasia griseœlla,* Canada; *Strobisia Aphroditeella, S. venustella, Depressaria cryptolechiella. D.? dubitella, D. albisparsella, D. bistrigella,* Kentucky; *D. Rileyella,* Ky. and Canada; *D. fuscoochrella, D. fuscoluteella,* Ky.; *D. obscurusella,* Ky. and Canada; *D. pseudacaciella,* Ky.; *D. bimaculella, D. cercerisella, D. pallidochrella, D. versicolorella, D. bicosto-maculella, D. querciella, Hagno* (nov. gen.) *faginella, Telphusa curvistrigella, Cirrha* (nov. gen.) *platanella* (=Depressaria albisparsella), *Adrasteia Alexandriacella, A. fasciella, Gelechia thoraceochrella, G. obscurella, G. fuscopulvella, G. fuscomaculella, G. quercinigracella, G. grisella, G. albistrigella, G. suffusella, G. discomaculella, G. aurimaculella, G.? curvilineella, G. physaliella. G. quercivorella. G. variiella, G? quinqueannulella, G. bidiomaculella, G. æquepulvella, G. similiella, G. rubensella, G. disco-ocellella, Agnippe biscolorella, A. fuscopulvella, Adrasteia querciella, Venilia* (nov. gen.) *albapalpella, Begœ* (nov. gen.) *costolutella, Ypsolophus eupatoriella, Y. Reedella, Y. quercipominella, Y querciella, Y. caryæfoliella, Y. straminiella, Sagaritis* (nov. gen.) *gracilella,* from Kentucky, with notes on habits of these and other species.

DIPTERA.

H. **Loew** (Berliner Entomol. Zeitschr. xvi, 49). "Diptera Americæ Septentrionalis Indigena." Besides the description of one hundred new species of North American Flies, an index to the whole ten centuries is given, besides a few notes on various genera and species treated in the work, as well as several typographical corrections. The new species are enumerated below.

R. **Osten Sacken** (Amer. Entomol. Soc., iii, 345). Biographical Notes on Diptera, No. 2.

A. S. **Packard**, Jr. (Second Annual Rep. on the Injurious and Beneficial Insects of Mass.). Notes on the Onion-fly, and a Tachinid parasite of *Pieris rapæ*. (Reprinted also in Bulletin Essex Inst., iv, 8.)

S. H. Scudder (Am. Nat.. vi, 665). Fossil Insects from the Rocky Mountains. Refers to the fossil Diptera collected by various exploring parties, numbering 65 specimens of 13 species. None are described or named.

C. V. Riley (Fourth Rep. on the Insects of Missouri) mentions the Tachinæ referred to below.

T. Glover (Monthly Rep. Dep. Agriculture). Entomological Record.

TIPULIDÆ.

H. Loew (Ber. Ent. Zeit., xvi) describes as new, *Dixa vinosa, Tipula præcisa, Ctenophora augustipennis.*

CECIDOMYIDÆ.

R. Osten Sacken (Trans. Amer. Ent. Soc., iii, 345) describes all the stages of *Diplosis resinicola* sp. n., found in resin lumps on *Pinus inops.* Also the gall and larva of *Cecidomyia cerasi-serotinæ* sp. n., from the wild cherry. Records capture of *Asphondylia monacha* O. S., in Tarrytown, N. Y., June 17, 1871.

STRATIOMYIDÆ.

H. Loew (Ber. Ent. Zeit., xvi) describes the following new species, *Odontomyia arcuata, O. plebeja, O. nigerrima, Stratiomyia insignis, S. constans, Clitellaria lata, Nemotelus glaber, Hermetia chrysopila.*

TABANIDÆ.

H. Loew (Ber. Ent. Zeit., xvi) describes *Chrysops gigantulus* sp. n.

LEPTIDÆ.

H. Loew (Ber. Ent. Zeit., xvi) describes *Alterix varicornis, Chrysopila modesta, Triptotricha* (gen. nov.) *lauta, Leptis incisa,* new species.

CYRTIDÆ.

H. Loew (Ber. Ent. Zeit., xvi) describes as new, *Eulonchus tristis, Oncodes eugonatus* and *O. melampus.*

MIDAIDÆ.

H. Loew (Ber. Ent. Zeit., xvi) describes *Midas tenuipes,* sp. n.

ASILIDÆ.

H. Loew (Ber. Ent. Zeit , xvi) describes as new, *Dioctria resplendens, Echthopoda formosa, Leptogaster brevicornis, Blax* (gen. nov.) *bellus, Pygostylus æmulator, Diogmites symmachus, Microstylum morosum, Steno-*

pogon breviusculus, *S. gratus*, *S. obscuriventris*, *S. univittatus*, *Heteropogon lautus*, *H. phœnicurus*, *Discocephala calva*. Loew also discusses the characters of Blax (gen. nov.), Taracticus (gen. nov.) and Pygostylus, genera of Dasypoginæ.

THEREUIDÆ.

H. Loew (Ber. Ent. Zeit. xvi) describes *Thereua fucata*, *T. melaneura* and *Xestomyza planiceps*, new species.

BOMBYLIDÆ.

H. Loew (Ber. Ent. Zeit. xvi) describes as new, *Aphœbantus* (gen. nov.) *cervinus*, *Leptochilus* (gen. nov.) *modestus*, *Bombylius albicapillatus*, *B. semirufus*, *Sparnopolius brevicornis*, *Ploas atratula*, *P. nigripennis*, *P. obesula*, *Allocotus* (gen. nov.) *Edwardsii*, *Phthiria egerimans*.

SYRPHIDÆ.

H. Loew (Ber. Ent. Zeit., xvi) describes as new, *Spilomyia longicornis*, *Myiolepta ærea*, *M. nigra*, *M. strigilata*, *Brachypalpus cyanogaster*, *B. frontosus*, *Helophilus polygrammus*, *Microdon baliopterus*, *Ceria tridens*.

PIPUNCULIDÆ.

H. Loew (Ber. Ent. Zeit., xvi) describes *Pipunculus fasciatus* and *P. subvirescens*, new species.

TACHYDROMIDÆ.

H. Loew (Ber. Ent. Zeit., xvi) describes *Drapetis divergens*, *gilvipes* and *unipila*, new species.

DOLICHOPODIDÆ.

H. Loew (Ber. Ent. Zeit., xvi) describes as new, *Paraclius pumilio*, *Pelastoneurus furcifer* and *Hydrophorus cerutias*.

TACHINIDÆ.

H. Loew (Ber. Ent. Zeit., xvi) describes *Blepharopeza adusta* and *Gymnosoma filiola*, new species.

C. V. Riley (4th Rep. Ins. Mo.) describes *Exorista phycitæ* sp. n. LeBaron, parasitic on *Phycita nebula* Walsh.; names, but does not describe, *Tachina* (*Masicera*) *anonyma* sp. n. parasitic on *Telea Polyphemus*, and also he thinks on six other moths or butterflies. He also mentions *Exorista leucaniæ* Kirk., var. *cecropiæ* Riley, as parasitic on *Cynthia cecropia*.

A. S. Packard, Jr. (2nd Report Ins. Mass.) figures a Tachinid parasite of *Pieris rapæ*.

ANTHOMYIDÆ.

H. Loew (Ber. Ent. Zeit., xvi) describes *Homalomyia femorata* Loew, and the following new species, *H. tetracantha*, *Cœnosia calopyga*, *C. modesta*, *C. nivea* and *Schœnomyza dorsalis*.

CORDYLURIDÆ.

H. Loew (Ber. Ent. Zeit., xvi) describes as new, *Cordylura capillata C. fulvibarba*, *C. lutea* and *C. vittipes*.

HELOMYZIDÆ.

H. Loew (Ber. Ent. Zeit., xvi) describes as new, *Blepharoptera discolor* and *pectinata*.

SCIOMYZIDÆ.

H. Loew (Ber. Ent. Zeit., xvi) describes *Sciomyza tenuipes* and *trabeculata*, new species.

SAPROMYZIDÆ.

H. Loew (Ber. Ent. Zeit., xvi) describes *Sapromyza macula* and *Lauxania eucephala*, new species.

EPHYDRIDÆ.

H. Loew (Ber. Ent. Zeit., xvi) describes *Notiphila pulchrifrons*, new species.

DROSOPHILIDÆ.

H. Loew (Ber. Ent. Zeit., xvi) describes *Drosophila obesa* and *sigmoides*, new species.

OSCINIDÆ.

H. Loew (Ber. Ent. Zeit., xvi) describes as new *Crassiseta eunota*, *Hippelates eulophus*, *H. pusio*, *Opetiophora* (gen. nov.) *straminea*, *Siphonella latifrons*, *Chlorops* (*Centor*) *procera*, *C.* (*Anthracophaga*) *maculosa*; *C.* (*Diplotoxa*) *alternata*, *confluens*, *Gundlachii*, *microcera*, *nigricans*, and *pulchripes*, *C.* (*Chlorops*) *mellea*.

COLEOPTERA.

Johnson Petit (Canadian Entomologist, 1873, pp. 3–6). Description of the wheat wire-worm (larva of *Agriotes mancus* Say).

List of Coleoptera taken at Grimsby (continued from 1871) p. 12.

De Bonvouloir. Monog. Eucnemides. (Ann. Ent. Soc. France, Cahier i, 1870, 1871, Cahier ii, 1872.)

C. J. S. Bethune (Can. Ent.) pp. 31, 52, 93, 111, 151, 175, 196. Reprint of Kirby's "Fauna Boreali-Americana."

Dr. Suffrian (Stettin Zeitung, 1872, p. 11). Synonymische Miscellaneen.

A. Matthews. Descriptions of two new species of *Amphizoa* discovered in Vancouver's Island by Mr. Jos. Beauchamp Matthews. (Cistula Entomologica, part v, London, 1872.)

J. L. LeConte, M.D. (Proc. Zool. Soc. Lond., Nov., 1872). On Platypsyllidæ, a new family of Coleoptera.

G. H. Horn, M.D. (Trans. Am. Ent. Soc., 1872.) Synopsis of the Malachiidæ of the United States, pp. 109–127.

The Brenthidæ of the United States, pp. 127–159.

Revision of species of Lebia of the United States, pp. 130–142.

Description of some new North American Coleoptera, pp. 143–152.

S. H. Scudder (Amer. Nat. vi, 665). Fossil Insects from the Rocky Mountains. Twelve species of Coleoptera are cited.

A. S. Packard, Jr. (Memoirs Peab. Acad. Sci., iii, 7). Embryological Studies on Hexapodous Insects. In this paper the author describes and figures the embryology of *Attelabus rhois*, *Telephorus fraxini*, *Gastrophysa polygoni* and *Mysia* 13-*punctata*.

A. S. Packard, Jr. (Ann. Rep. Peab. Acad. Sci. for 1871). List of the Coleoptera collected in Labrador. The species were identified by Drs. Horn and LeConte. The list is accompanied with the dates and special localities.

A. S. Packard, Jr. (2d. Ann. Rep. Injurious Insects of Mass.). The habits of several beetles are noticed.

L. W. Schaufuss (Nunquam Otiosus, Sept., 1870, pp. 1–12). Notes on the genus Pleocoma Lec.

CICINDELIDÆ.

G. H. Horn (*loc. cit.* p. 143). *Omus Lecontei* n. sp. Cal.

CARABIDÆ.

G. H. Horn (*loc. cit.* p. 143). *Cychrus rugiceps*, n. sp. Cal. (p. 131)

Lebia majuscula. Chaud. Tex. Penins. Cal. (p. 139) *L. miranda* n. sp., Ariz.; *L. Spraguei* n. sp., Tex.

AMPHIZOIDÆ.

A. MATTHEWS. *Amphizoa Lecontei, A. Josephi,* Vancouver Island.

HYDROPHILIDÆ.

G. H. HORN (*loc. cit.* p. 144). *Limnocharis* (n. g.,) *piceus* n. sp., Cal.

LEPTINIDÆ.

G. H. HORN (*loc. cit.* p. 145). *Leptinus validus* n. sp., Hudson's Bay.

PLATYPSYLLIDÆ.

J. L. LECONTE (*loc. cit.* pp. 799-804). PLATYPSYLLIDÆ, new family of Coleoptera founded on *Platypsylla castoris* Ritsema, an insect parasitic on the North American beaver; illustrated by an octavo plate.

TROGOSITIDÆ.

G. H. HORN (*loc. cit.* p. 146). *Pityophagus rufipennis* n. sp., Oregon.

COLYDIIDÆ.

G. H. HORN (*loc. cit.* p. 146). *Deretaphrus Oregonensis* n. sp., Oregon.

SCARABÆIDÆ.

L. W. SCHAUFUSS (*loc. cit.* p. 5). *Pleocoma Staff*; p. 11, *P. hirticollis,* both from California.

EUCNEMIDÆ.

DE BONVOULOIR (Monog. 1870). *Deltometopus* (n. g., p. 171) *ereptus* n. sp., p. 185. Louisiana; *Dromæolus sejunctus* n. sp., p. 266, Canandaigua; *D. Marseuli* n. sp., p. 268, New York; *D. novitius* n. sp. p. 270, Louisiana.

DE BONVOULOIR (Monog. 1872). *Fornax molestus* n. sp., p. 376, U. S.; *Entomophthalmus* (n. g., p. 513) *pallens*, p. 518, Tennessee; *Microrhagus oblitus*, n. sp., p. 552.

G. H. HORN (*loc. cit.* p. 147). *Phænocerus Americanus* n. sp., Vancouver.

ELATERIDÆ.

G. H. HORN (*loc. cit.* p. 147). *Cardiophorus mimeticus* n. sp., Cal.; *Agriotes Thevenetii* n. sp., Cal.; *Limonius Crotchii* n. sp., Oregon.

LAMPYRIDÆ.

A. S. PACKARD, Jr. (3d Mem. Peab. Acad. Sci.) describes and figures the embryology of *Telephorus fraxini.* It differs from the other Coleoptera whose development is known, in the primitive band floating in the centre of the yolk, instead of being surrounded by it.

MALACHIIDÆ.

G. H. HORN (*loc. cit.* p. 111). *Temnopsophus* (n. g.,) *bimaculatus* n. sp., Louisiana; *Malachius mixtus* n. sp., Cal.; *M. Ulkei* n. sp., Dak.; *Microlipus lævicollis* n. sp., Neb.; *Pseudebæus* (n. g.), *Attalus rostratus* n. sp., Cal.; *A. trimaculatus* Motsch. (*elegans* Horn); *A. Oregonensis* n. sp., Or.; *A. varians* n. sp., Tex.; *A. parallelus* n. sp., Tex.; *A. Pettiti* n. sp., Can.; *A. rufiventris* n. sp., Tex., Ohio.

MONOMMIDÆ.

G. H. HORN (*loc. cit.* p. 149). *Hyporhagus Gilensis* n. sp., *H. opuntiæ* n. sp., both from Arizona

PYTHIDÆ.

G. H. HORN (*loc. cit.* p. 150). *Sphalma* (n. g.), *quadricollis* n. sp., Cal.

CERAMBYCIDÆ.

A. S. PACKARD, Jr. (2d Ann. Rep. Ins. Mass. 17) describes and figures *Arhopalus fulminans* Fabr. and notices its habits; also *Callidium variabile*, and *Physocnemum brevilineum* Say.

CHRYSOMELIDÆ.

G. H. HORN (*loc. cit.* p. 152). *Andrector* (n. g.), *sexpunctatus* n. sp., Texas.

A. S. PACKARD, Jr. (3d Mem. Peab. Acad. 10) describes and figures the embryology of *Gastrophysa polygoni* and *Mysia 13-punctata*. Its development is said to agree substantially with that of Donacia.

SUFFRIAN (Stettin Zeitung p. 21). *Donacia pubicollis* n. sp., Illinois.

BRENTHIDÆ.

G. H. HORN (*loc. cit.* p. 127). *Brenthus peninsularis* n. sp., *B. lucanus* n. sp., both from the peninsula of Lower California.

CURCULIONIDÆ.

A. S. PACKARD, Jr. (3d. Mem. Peab. Acad. Sci.) describes the habits and embryology of *Attelabus rhois*. Its development in the egg is in its essential features like that of Donacia.

A. S. PACKARD, Jr. (2d Ann. Rep. Ins. Mass. 18) figures and describes *Ceutorhynchus assimilis* Payk. and notes its occurrence on the radish in Maine; *Otiorhynchus picipes* Fabr. *adv.* Europe, and larva of a species of *Balaninus* found in chestnuts.

SCOLYTIDÆ.

P. S. SPRAGUE (Proc. Bost. Nat. Hist., xiv, 206) notices the habits of *Cryphalus asperulus* Lec.

HEMIPTERA.

W. LeBaron (Second Annual Report on the Noxious Insects of the State of Illinois).

L. Provancher (Le Naturaliste Canadien).

C. V. Riley (Fourth Annual Report of the Insects of Missouri).

O. M. Reuter, Nabidæ novæ et minus cognitæ (Ofversigt af Kongl. Vetensk. Akad. No. 6).

C. Staal, Enumeratio hemipterorum (Kongl. Svensk Vetensk. Akad. Handlingar. Vol. 10).

P. R. Uhler, Notices of the Hemiptera of the Western Territories of the U. S. (In Dr. Hayden's Preliminary Report on Montana).

F. Walker, Catalogue of Hemiptera Heteroptera in the British Museum. Part v.

F. Walker, Hemiptera (Canadian Entomologist) Heteroptera of America north of the U. S.

R. H. Stretch (Proc. Cal. Acad. Sci. iv, 262). Notes on a species of Coccus recently found in California.

S. H. Scudder (Amer. Nat., vi, 665). Fossil Insects from the Rocky Mountains. Two Hemiptera are cited.

(HETEROPTERA.)

SCUTELLERIDÆ.

P. R. Uhler (*l. c.*) reports *Corimelæna nitiduloides* Wolff, *C. extensa* Uhler, *Homœmus æneifrons* Say, and describes as new *H. bijugis*, from Colorado, etc.

L. Provancher (*l. c.*) describes as new *Eurygaster Nicoletanensis*, from Upper Canada. It is only a local form of *E. alternatus !* Say.

F. Walker (Canad. Ent.) records *Homœmus exilis* H. Sch., *Corimelæna unicolor* Beauv., *C. ater* Dallas.

PENTATOMIDÆ.

L. Provancher (*l. c.*) describes as new *Perillus marginatus*, and *Brochymena 4-notata*. The former is the previously described *Perillus circumcinctus* Staal.

C. V. Riley (*l. c.*) notes the predaceous habits of *Perillus circumcinctus* Staal, *Euschistus punctipes* Say, and *Arma* (Podisus) *spinosus*

Say; and reports *Murgantia histrionica* Hahn to be destructive to the cabbages, in Missouri, Texas, etc.

C. STAAL (*l. c.* p. 6) notices *Discocephala notulata* Staal, *D. clypeata* Staal, *Dinocoris obscurus* Dallas, *Pelidnocoris Stali* Hagl., *Empicorus ramosus* Walk., Mexico, *Alathetus rufitarsis* Dallas, Jamaica, *Podops dubius* Beauv., Cuba, *P. cinctipes* Say, N. America; *Brochymena myops* Staal, *B. quadripustulata* Fab., *B. Annulata* Fab., *B. arborea* Say, *B. Carolinensis* Westw., *B. Harrisii* Uhler, United States; *Mecidea longula* Staal, Texas; *Aelia Americana* Dallas, *Neottiglossa undata* Say, *Cosmopepla carnifex* Fab., *Mormidea lugens* Fab., *Oebalus pugnax* Fab., *Euschistus fissiles* Uhler, *E. servus* Say, *E. tristigma* Say, *E. variolarius* Beauv., *E. ictericus* Linn., *E. crenator* Fab., *E crassus* Dallas, *Proxys punctulatus* Beauv., *Cœnus delius* Say, *Hymenaarys æqualis* Say, *H. nervosa* Say, *Menecles insertus* Say, *Prionosoma podopioides* Uhler, *Lioderma saucia* Say, *Rhytidolomia senilis* Say, *Antheminia Lynx* Fab., *Trichopepla semivittata* Say, *Thyanta perditor* Fab., *T. custator* Fab., *T. pallido-virens* Staal, *T. tæniola* Dallas, *T. rugulosa* Say, *Murgantia histrionica* Hahn, *Perillus bioculatus* Fab., *Nezara viridula* Linn., *N. Pensylvanica* DeGeer, *N. hilaris* Say, *Banasa dimidiata* Say, *B. calinus* Dallas, *Arvelius albo-punctatus* DeGeer, *Edusa bifida* Say, *Acanthosoma cruciata* Say, *A. affinis* Westw., *A. borealis* Westw., *A. nebulosa* Kirby, *A. lateralis* Say, *Pentatoma laticornis* Say, *P. calva* Say, *P. faceta* Say, *P. pantherina* Westw., *P. Harrisii* Westw., *P. picea* Dallas, *P. dubia* Dallas, United States and Canada; also *Brochymena obscura* H. Schf., *B. Poeyi* Guer., *Cosmopepla decorata* Hahn, *C. conspicillaris* Dallas, *Mormidea collaris* Dallas, *M. angustata* Staal, *M. pictiventris* Staal, *M. notulata* H. Schf., *M. discoidea* Dallas, *M. geographica* Guer., *M. cubrosa* Dallas, *Euschistus verrucifer* Staal, *E. bifibulus* Beauv., *E. spurculus* Staal, *E. comptus* Walk., *E. biformis* Staal, *E strenuus* Staal, *Berecynthus delirator* Fab., *Padæus irroratus* H. Schf., *P. trivittatus* Staal, *Proxys victor* Fab., *P. punctulatus* Beauv., *Cœnus delius* Say, *Chlorochroa ligata* Say, *Thyanta tæniola* Dallas, *T. casta* Staal, *Chlorocoris atrispinus* Staal, C. *rufispinus* Dallas, *C. rubescens* Walk., *C. distinctus* Sign., *Loxa flavicollis* Drury, *Murgantia munda* Dallas, *M. violascens* Westw., *Arocera melanopyga* Staal, *A. splendens* Blanch., *A. rufonotata* Staal, *Runibia perspicua* Fab., *R. proxima* Dallas, *Vulsirea insignis* Blanch., *V. variegata* Drury, *V. violacea* Fab., *Pharypia pulchella* Drury, *P. nitidiventris* Staal, *P. fasciata* Hagl., *Nezara stictica* Dallas, *N. marginata* Beauv., *N. sparnius* Dallas, *Piezodorus Guildinii* Westw., *Phineus fusco-punctatus* Staal, *Taurocerus achilles* Staal, *T. hector* Staal, *Pharnus inconspicuus* H. S., *P. variegatus* Guer., *Brachystethus rubromaculatus* Dallas, *Peromatus robustus* Hagl., *Edessa taurina* Staal, *E. Arabs* Linn., *E. arietina* Staal, *E. hædula* Staal, *E. olivacea* Staal, *E. nigricornis* Staal, *E. reticulata* Staal, *E. nigrispina* Staal, *E junix* Staal, *E. vinula* Staal, *E. rixosa* Staal, *E. puncticornis* Staal, *E. patricia* Staal, *E. lineigera* Staal, *E. rufo-marginata* Staal, *E. meditabunda* Fab., *E. albicors* Staal, *E. præcellens* Staal, *E. jurgiosa* Staal, *E. lepida* Staal, *E. pudica* Staal, *E. pudibunda* Staal, *Olbia caprina* Staal, *Pentatoma cruenta* Beauv., *Pentatoma ovalis* Westw., *P. obsoleta* Dallas, West Indies and Mexico; and describes as new *Discocephala marginella*, *Melanodermus tartareus*, *Brochymena cariosa*, *Melanostoma sulcifrons*, *M. cavifrons*, *Mormidea albisignis*, *M. sordidula*, *M. grisescens*, *Ocbalus insularis*, *Euschistus impictiventris*, *E. rugifer*, *E. integer*, *Hymenarcys reticulata*, *Rhytidolomia Belfragei*, *Chlorochroa Uhleri*, *C. Sayi*, *Trichopepla atricornis*, *Peribalus limbolarius*, *Chlorocoris subru-*

gosus, *Fecelia minor*, *Banasa Packardii*. *B. euchlora*, *Piezodorus herbaceus*, *Modicia sexlineata*, *Edessa laticornis*, *E. conspersa*, *E. Westringii*, *E. picticornis*, *E. Mexicana*, *E. punctiventris*, from Texas, Mexico and the West Indies.

P. R. UHLER (*l. c.*) reports *Brochymena serrata* Fab., *B. arborea* Say, *Prionosoma podopioides* Uhler, *Perillus claudus* Say, *P. exapta* Say, *P. circumcinctus* Staal, *Podisus spinosus* Dallas, *Zicrona cuprea* Dallas, *Cosmopepla carnifex* Fab., *Neottiglossa undata* Say, *Mormidea lugens* Fab., *Murgantia histrionica* Hahn, *Cœnus delia* Say, *C. æqualis* Say, *Euschistus fissilis* Uhler, *E. punctipes* Say, *E. pyrrhocerus* H. Schf., *Carpocoris lynx* Fab., *Pentatoma ligator* Say, *P. faceta* Say, *Thyanta perditor* Fab., *T. custator* Fab., *T. rugulosa* Say, Colorado, Arizona, etc.; and describes as new *Homœmus bijugis*. *Microporus obliquus*, *Peribalus modestus*, *Holcostethus abbreviatus*, *Pentatoma granulosa*, from Montana, etc.

F. WALKER (Canad. Ent.) records *Arma modesta* Dallas, *Zicrona cuprea* Dallas, *Z. marginella* Dallas (already cited many times by accurate authors under its correct name, *Perillus exaptus* Say), *Æthus bilineatus* Say, *Sehirus ligatus* Say, *Euschistus punctipes* Say, *E. luridus* Dallas, *Ælia trilineata* Kirby, *Eysarcoris carnifex* Fab., *Pentatoma juniperina* Linn., *P. picea* Dallas, *Rhaphigaster catinus* Dallas, *Acanthosoma cruciata* Say, Canada. Several others of these are also preoccupied, and belong to other genera.

COREIDÆ.

L. PROVANCHER (*l. c.*) describes as new genus and species *Tetrarhinus Quebecensis*. It is the previously described *Protenor Belfragei* Hagl.

P. R. UHLER (*l. c.*) notices *Archimerus calcurator* Fab., *Merocoris distinctus* Dallas, *Leptoglossus phyllopus* Linn., *Chelinidea vittigera* Uhler, *Margus inconspicuus* H. Schf., *Catorhintha mendica* Staal, *Ficana apicalis* Dallas, *Anasa tristis* DeGeer, *Alydus eurinus* Say, *Stachyocnemus apicalis* Dallas, *Protenor Belfragei* Hagl., *Neides spinosus* Say, *Harmostes reflexulus* Say, *Anfeius impressicollis* Staal, *Corizus borealis* Uhler, *C. lateralis* Say, *Leptocoris trivittatus* Say, *Jadera hæmatoloma* H. Schf., Colorado, Dakota, etc., and describes as new *Metapodius Thomasii*. *Alydus Pluto*. *Neides decurvatus*, *Dasycoris humilis*, and *Corizus viridicatus*, from Colorado, etc.

F. WALKER (*l. c.*) cites *Catorhintha guttula* Fab., *C. selector* Staal, *Nirovecus claviger* Staal, *Madura perfida*, *Plunentis tabulatus* Burm., *Plapigus circumcinctus* Staal, *Harmostes virescens* Dallas, *H. serratus* Fab., *H. dorsalis* Burm., *H. nebulosus* Staal, *Margus inconspicuus* H. Schf., *Margus inornatus* Staal, *Rhopalus punctipennis* Dallas. *R. punctiventris* Dallas, *R. maculigerus* Uhler, *R. sidae* Fab., *R. hyalinus* Fab., *R. scutatus* Staal. *R. ventralis* Signt., from N. America and Mexico, and describes as new *Namacus rufescens*, from Mexico.

F. WALKER (Canad. Ent.) records *Alydus calcaratus* Linn., Canada.

LYGÆIDÆ.

W. LEBARON (*l. c.*) details the habits of *Micropus leucopterus* Say, in Illinois.

L. PROVANCHER (*l. c.*) describes as new *Rhyparochromus punctatus* and *Nysius Saint-Cyri*, from Upper Canada.

P. R. Uhler (*l. c.*) notices *Lygæus turcicus* Fab., *L. fasciatus* Dallas, *L. bistriangularis* Say, *L. facetus* Say, *L. bicracis* Say, *Nysius Californicus* Staal, *Ophthalmicus piceus* Say, *Emblethis arenarius* Linn., *Rhyparochromus fallax* Say, *Plociomerus diffusus* Uhler, from Colorado, etc., and describes as new *Lygæus admirabilis*, *Nysius angustatus*, *Heraeus insignis* Colorado.

F. Walker (*l. c.*) cites *Lygæus fasciatus* Dallas, *L. reclivatus* Say, *L. trimaculatus* Dallas, *L. lineola* Dallas, *L. turcicus* Fab., *L. bicrucis* Say, *L. costalis* H. Schf., *L. analis* Dallas, *L. gutta* H. Schf., *L. flavomarginellus* Staal, *L. varicolor* Dallas, *L. alternans* H. Schf., *L. unifasciatus* Fab., *L. elatus* Staal, *L truculentus* Staal, *L. trux* Staal, *L. ruficeps* Staal, *L. circumlitus* Staal, *L. rubriger* Staal, *L. thoracicus* Staal, *L. vittiscutis* Staal, *L. pallescens* Staal, *L. pallidocinctus* Staal, *L. brevicollis* Staal, *L. Tullus* Staal, *L. lateralis* Staal, *L. Poeyi* Guer., *L. marginellus* Dallas, *L. vicinus* Dallas, *L. aulicus* Fab., *L. quadriguttatus* Staal, *L. collaris* Staal, *L. pulchellus* Dallas, *Belonochilus numenius* Say, *Nysius Californicus*, Staal, *N. basalis* Dallas, *N. scutellatus* Dallas, *N. Jamaicensis* Dallas, *N. spurcus* Staal. *Aphanus tripunctatus* Dallas, *A. nodosus* Say, *Eremocoris ferus* Say, *Rhyparochromus lineatus* Dallas, *R. basalis* Dallas, *R. scutellatus* Dallas, *R. vicinus*, Dallas, *R. fraternus* Uhler, *R. picturatus* Uhler, *Pterotmetus abbreviatus* Uhler, *Plociomerus parvulus* Dallas, *P. bilobatus* Say, *P. constrictus* Say, *P. diffusus* Uhler, *P. piliger* Staal, *P. litigiosus* Staal, *P. oblongus* Staal, *Orthæa guttata* Dallas, *Oxycarenus coriacipennis* Staal, *Micropus fulvipes* Dallas, *M. leucopterus* Say, *Opthalmicus griseus* Dallas, *O. borealis* Dallas, *O. niger* Dallas, *O. tristis* Staal, *O. pallens* Staal, *O. lividipennis* Staal, *Cymus Resedæ* Panz., *C. Bohemani* Staal, *C. Franciscanus* Staal, *Cymodema virescens* Fab., *Oedancala dorsilinea* Amyot, *Myodocha serripes* Oliv., *M. giraffa* Staal, Mexico, West Indies and the U. S., and describes *Lygæus marginalis*, *L. dimidiatus*, Mexico, *L. anticus*, St. Domingo; *Ischnodemus longus*, Mexico; *Thaumastopus alacris*, N. America.

LARGIDÆ.

P. R. Uhler (*l. c.*) notices *Largus succinctus* Linn., from Arizona, etc.

PYRRHOCORIDÆ.

F. Walker (*l. c.*) reports *Dysdercus suturellus* H. S., *D. mimus* Say, *D. albidiventris* Staal, *D. concinnus* Staal, *D. flavolimbatus* Staal, *D. lunulatus* Uhler, *D. andreæ* Linn., *D. sanguinarius* Staal, Mexico and the West Indies, and describes as new *D. mundus*, Mexico; *D. Jamaicensis*, *D. fervens*, Jamaica and St. Domingo.

PHYTOCORIDÆ.

L. Provancher (*l. c.*) describes as new *Miris vicinus*, *M. Belangeri*, *M. viridis*, *Collaria* (new genus) *Meilleurii*, *Capsus flavonotatus*, *C. flavipes*, *Lygus brunneus*, *L. dorsalis*, *L. fuscosus*, *L. unicolor*, *Rhopalotomus rubronotatus*, Upper Canada.

P. R. Uhler (*l. c.*) notes *Trigonotylus ruficornis* Fallen, *Calocoris rapidus* Say, *Resthenia insignis* Say, *Lopidea media* Say, *Lygus lineolaris* Beauv., from Colorado, etc., and describes *Megalocerœa debilis*, *M. rubicunda*, *Leptopterna amœna*, *Calocoris Palmeri*, *Resthenia confra-*

terna, *Lopidea*, and *Hadronema* (new genera), *H. militaris*, *Lygus* (new genus) *annexus*, Dakota; *D. hesperia*, *Pœciloscytus venaticus*, *P. diffusus*, *Rhopalotomus Pacificus*, *R. brachycerus*, *Labops hesperius*, *Camptobrochis nebulosus*, *Tinicephalus simplex*, *Plagiognathus obscurus*, *Agalliastes associatus*, from Colorado, Utah and Arizona.

ARADIDÆ.

P. R. UHLER (*l. c.*) notes *Aradus rectus* Say, Colorado.

ANTHOCORIDÆ.

F. WALKER (*l. c.*) notices *Anthocoris borealis* Dallas, *Lyctocoris campestris*, *Triphleps insidiosus* Say, from North America.

REDUVIDÆ.

L. PROVANCHER (*l. c.*) describes as new *Reduvius albosignatus*, and *Darbanus Georgiæ*, from Georgia.

O. M. REUTER (*l. c.* pp. 79—.) describes as new *Nabis crassipes*, Mexico; *N. Sericans*, Texas; *N. Sordidus*, Mexico; *N. pallescens*, Penn., *N. annulatus*, and *N. vicarius*, Illinois; *N. roseipennis*, Wisconsin; *N. punctipes*, New Jersey; *N. Kalmii*. Wisconsin; *N. rufusculus*, New York; *Metatropiphorus Belfragei*, Texas, and notices *Nabis coleoptratus* Kirby and *N. ferus* Linn., from United States.

C. STAAL (*l. c.* pp 70.—) notices *Sinea diadema* Fab., *Acholla multispinosa* DeGeer, *Prionotus cristatus Linn.*, *Atrachelus cinereus* Fab., *Fitchia nigrovittata* Staal, *Milyas cinctus* Fab., *Zelus bilobus* Say, *Diplodus luridus* Staal, *D. Renardii* Kol., *Apiomerus crassipes* Fab., *A. spissipes* Say, *Hammatocerus purcis* Drury, *Ectrichodia cruciata* Say, *Pothea æno-nitens* Staal, *Sirthenca carinata* Fab., *Rasahus biguttatus* Say, *Melanolestes picipes* H. Schf., *Conorhinus variegatus* Drury, *C. sanguisugus* Lec., *C. Gerstaeckeri* Staal, *Opsicoetus pungens* Lec., *Centromelus languida* Staal, *C. infirma* Staal, *Pygolampis sericea* Staal, *P. pectoralis* Say, *Stenopoda culiciformis* Fab., *Narvesus Carolinensis* Staal, *Oncerotrachelus acuminatus* Say, *Emesa longipes* DeGeer, *Barce annulipes* Staal, *Luteva Carolina* H. Schf., *Reduvius ventralis* Say, *Ploiaria fraterna* Say, *P. errabunda* Say, United States; also, *Sinea coronata* Staal, *S. sanguisuga* Staal, *S. raptoria* Staal, *S. defecta* Staal, *S. integra* Staal, *Acholla tabida* Staal, *Prionotus depressicollis* Staal, *Plœogaster acantharis* Wolff., *Heza pulchripes* Staal, *H acantharis* Linn., *H. clavata* Guer., *Ricolla simillima* Staal, *Rocconota octispina* Staal. *R. tuberculigera* Staal, *Repipta fuscipes* Staal, *R. nigronotala* Staal. *Castolus subinermis* Staal, *C. trinotatus* Staal, *C. plagiaticollis* Staal, *Graptocleptes sanguineiventris* Staal, *Notocyrtus dromedarius* Staal. *Milyas punctipes* Amyot, *M. zebra* Staal, *Zelus longipes* Linn., *Z. rubidus* Serv., *Z. speciosus* Burm., *Diplodus janus* Staal. *D. litigiosus* Staal. *D. ruficeps* Staal, *D. exsanguis* Staal, *D. grassans* Staal, *D. nugax* Staal, *D. mimus* Staal, *D. umbratilis* Staal, *D. ambulans* Staal, *D. cognatus* Costa, *D. tetracanthus* Staal, *D. phalangium* Fab., *Apiomerus elatus* Staal, *A. subpiceus* Staal, *A. mœstus* Staal, *A. flaviventris* H. Schf., *A. pictipes* H. Schf., *A. Burmeisteri* Guer., *Hammatocerus luctuosus* Staal, *Ectrichodia ruficollis* Staal, *Rasalius albomaculatus* Mayr., *R. sulcicollis* Serv., *R. guttatipennis* Staal, *Thymbreus crocinopterus* Staal, *Meccus phyllosomus* Burm., *M. Mexicanus* H. Schf., *Conoshinus dimidiatus* Lat., *C. macu-*

lipennis Staal, *C. rubro-fasciatus* DeGeer, *Macrophthalmus histrionicus* Staal, *Spiniger limbatus* Serv., *Leogorrus litura* Fab., *L. venator* Staal, *Microcleptes bannulipes* Staal, *Nalata setulosa* Staal, *Gnathobleda litigiosa* Staal, *Saica tibialis* Staal, *Bactrodes spinulosus* Staal, *Westermannia annulata* Dohrn, *W. tenerrima* Dohrn, *Ghilianella Gerstaeckeri* Dohrn, *G. varicornis* Dohrn, *G. Signoriti* Dohrn, *Cerascopus Fairemairei* Dohrn, *Lutera macrophthalma* Dohrn, *L. Gundlachii* Dohrn, *Palacus cubensis* Dohrn, *P. pallidus* Guer., *Deliastes reticulatus* Dohrn, Mexico and the West Indies; and describes as new *Acholla ampliata*, *Heza annulicormis*, *Fitchia spinosula*, *Zelus cervicalis*, *Zelus subimpressus*, *Homalocoris maculicollis*, *Ectrichodia cinctiventris*, *E. crucifera*, *Rasahus thoracicus*, *Meccus pallidipennis*, *Gnathobleda tumida*, *Spilalonius geniculatus*, from Mexico, Texas and the West Indies.

P. R. UHLER (*l.c.*) notices *Nabis inscriptus* Kirby, *N. subcoleoptratus* Kirby, *Sinea multispinosa* DeGeer, *Fitchia nigrovittata* Staal, *Diplodus luridus* Staal, *Milyas cinctus* Fab., *Herega spissipes* Say, *Melanolestes picipes* H. Schf., *M. abdominalis* H. Schf., *Stenopoda cinerea* Lap., from Colorado, Kansas and Indian Territory, and describes *Pindus socius* from Idaho.

SALDÆ.

L. PROVANCHER (*l.c.*) describes as new *Sciodopterus Bouchervillei*, *Salda major*, *S. obscura*, *S. variegata*, from Upper Canada.

P. R. UHLER (*l.c.*) notices *Salda interstitialis* Say, and describes *S. coriacea*, from Ogden, Utah.

VELIIDÆ.

P. R. UHLER (*l.c.*) describes as new the genus *Macrovelia*, with the new species *M. Hornii*, from New Mexico, California and Arizona.

HYDROMETRIDÆ.

P. R. UHLER (*l.c.*) reports *Hygrotrechus remigis* Say, and *Limnotrechus marginatus* Say, from Idaho.

NAUCORIDÆ.

P. R. UHLER (*l.c.*) reports *Ambrysus Signoreti* Staal, from Red Butte.

CORISIÆ.

L. PROVANCHER (*l.c.*) describes as new *Corisa* 3-*lineata*, and *C.* 2-*lineata*, from near Quebec.

(HOMOPTERA.)

DELPHACIDÆ.

L. PROVANCHER (*l.c.*) describes as new *Delphax unipunctata* and *D. furcata*, Upper Canada.

CICADIDÆ.

W. LEBARON (*l.c.*) gives an account of the *Cicada septendecim* Linn.

L. PROVANCHER (*l.c.*) reports *C. septendecim*, from Upper Canada.

C. V. RILEY (*l.c.*) reports recent broods of *C. septendecim*.

MEMBRACIDÆ.

L. PROVANCHER (*l.c.*) describes as new *Tragopa brunnea*.

CERCOPIDÆ.

L. PROVANCHER (*l.c.*) describes as new *Cephalelus Americanus*, *Ptyelus albiceps*, *Clastoptera Saint-Cyri*, from Upper Canada.

TETTIGONIDÆ.

L. PROVANCHER (*l.c.*) describes as new *Tettigonia Quebecensis*, *Acopsis viridis*, *Penthimia picta*, *Bythoscopus sanguinolentus*, *B. 4-punctatus*, *Pediopsis flavescens*, *Macropsis clitellarius*, *M. ocellatus*, *Janus aurantiacus*, *J. subcupreus*, *J. melanogaster*, *J. 6-punctatus*, *J. citronellus*, *J. nervalus*, *Typhlocyta rosea*, from Upper Canada.

PSYLLIDÆ.

W. LEBARON (*l.c.*) notices *Psylla pyri* Linn., to be injurious to pear trees in Illinois.

L. PROVANCHER (*l.c.*) describes as new *Diraphia virescens*, *Psylla ochracea*, and *P. brunnea*, from Upper Canada.

APHIDÆ.

W. LEBARON (*l.c.*) describes *Lachnus dentatus* as new, and as injurious to willows in Illinois.

C. V. RILEY (*l.c.*) gives a detailed account of *Phylloxera vitifoliæ* Fitch.

COCCIDÆ.

W. LEBARON (*l c.*) details the habits of *Mytilaspis salicis*, n. sp., and of *M. conchiformis* Gmelin, and *M. pinifolii* Fitch, in Illinois.

R. H. STRETCH (Proc. Cal. Acad. Sci., iv, 262) describes the structure and habits of three species of Coccidæ.

ORTHOPTERA.

T. GLOVER. Illustrations of North American Entomology (United States and Canada): Orthoptera. 4to. 13 Plates. Washington D. C. (for the author). These illustrations are not accompanied by any descriptions; at the end of the work there are some notes on the food and habits of Orthoptera, and an alphabetical list of vegetable and animal substances injured by them. It is to be regretted that the species are not arranged systematically, but this was not possible under the circumstances. The author includes in the order Thripidæ, Poduridæ and Mallophaga.

T. GLOVER. In the Monthly Reports of the Department of Agriculture for February, March, May and June, October, and November and December, 1872.

J. ORTON (American Naturalist, Vol. vi, Nov., 1872, p. 625).

S. H. SCUDDER (In the final Report of the United States Geological Survey of Nebraska, etc., by F. V. Hayden). Notes on the Orthoptera collected by Dr. F. V. Hayden in Nebraska.

This paper contains descriptions of several new species, and remarks on the devastating grasshoppers of North America.

S. H. SCUDDER (Amer. Nat., Nov. 1872, Vol. vi, p. 667) makes allusions to an undescribed fossil Orthopter.

C. THOMAS (In the Preliminary Report of the Geological Survey of Montana etc., by F. V. Hayden). Notes on the Saltatorial Orthoptera of the Rocky Mountain Regions. This paper contains the descriptions of several new species; also the outline of a proposed arrangement of the subdivisions of *Acrididæ.*

C. THOMAS (Canadian Entomologist, iv, p. 16).

F. WALKER. Catalogue of the specimens of Dermaptera Saltatoria in the Collection of the British Museum. 8vo. Parts iv, v, pp. 605-850: Supplement to the Catalogue of Blattariæ, pp. 1-43: Supplement to the Catalogue of Dermaptera Saltatoria pp. 1-116. The date in the title page of pt. v (of some copies, perhaps all) is wrong, being 1870 when it should be 1871 as is shown by the preface on the next page. These parts complete this Catalogue of one of the most important collections of Orthoptera in the world. It is to be regretted that the work has not been performed with more care, the generic and specific descriptions being in numerous instances of very little value. In some instances genera are introduced in the synoptical tables which are omitted in the descriptive portion of the work. The fifth part in addition to the supplements contains a notice of the geographical distribution of the genera; and remarks on the arrangement of the families.

GRYLLIDÆ.

F. Walker (Suppl. to Cat. Dermap. Salt.) describes as new *Gryllus debilis*, Nicaragua; *Platydactylus diversus* and *P. lituratus*, Nicaragua; and describes a species from Brazil which he refers to *Pilurgis teres*.

T. Glover (Ill. N. A. Ent. Orth.) figures the following species: *Tridactylus terminalis*, *Gryllotalpa longipennis*, *G. borealis*, *Gryllus luctuosus*, *G. Pensylvanicus*, *G. neglectus*, *G. abbreviatus*; *Nemobius vittatus*, *N. fasciatus*, *N. exiguus*; *Orocharis saltator*; *Phyllopalpus pulchellus*; *Œcanthus niveus*, *Œ. bipunctatus*.

C. Thomas (Geol. Surv. Mont.) gives localities in the West where *Gryllus abbreviatus*, *G. luctuosus* and *Œ. niveus* are found.

S. H. Scudder (Geol. Surv. Neb.) mentions *Gryllus neglectus*, *G. personatus*, *Nemobius vittatus*, and *Œcanthus niveus*.

S. H. Scudder (Am. Nat., Nov., 1872, 667) mentions a fossil Orthopter, "probably of the genus Nemobius," Wyoming Territory.

LOCUSTIDÆ.

F. Walker (Suppl. to Cat. Dermap. Salt.) describes as new the following genera and species: *Aganacris* (n gen.) *micans*, Amazon Region; *Valna nigropicta*, Para; *Microcentrum rividum*, Orizaba; *Phylloptera intacta*, Nicaragua; *Meroncidius vittifrons* (n. gen.), Nicaragua; *Anonistus obliterans*. Brazil; *Clisis* (n. gen.) *annulicornis*, Brazil; *Acanthodiphrus* (n. gen.) *conspersus*, Nicaragua.

C. Thomas (Geol. Surv. Montana) describes as new, *Stenopelmatus fasciatus*, Wyoming; *Ceuthophilus pallidus*, Colorado; *C. castaneus*, California, *C. pacificus*, California, *C. bilobatus*, California; *Anabrus Coloradus*, Colorado; *Thamnotrizon scabricollis*, Montana; *Decticus pallidipalpus*, Utah and Idaho; *Locusta fuliginosa*, Arizona; *L. occidentalis*, California. *Copiophora mucronata* is also described; the position and characters of the genus *Anabrus* discussed and the author's former emendation corrected; he restores *Thamnotrizon purpurascens* Thos.=*Anabrus purp.* Uhler, to this genus, and removes *A. Haldemannii*, *A. minutus*, and *A. Stevensoni* therefrom, referring them, with doubt, to *Pterolepis* Fisch. (not Serv.); refers *Thamnotrizon trilineatus* to *Decticus* (?). Gives localities of *Udeopsylla robusta* and *Ephippitytha gracilipes*.

C. Thomas (Can. Ent. iv, p. 14) describes as new *Copiophora mucronata*, found in the greenhouse of the Department of Agriculture.

S. H. Scudder (Geol. Surv. Neb.) mentions *Ceuthophilus gracilipes*; *Udeopsylla robusta*, and describes as new *Xiphidium saltans*; *Conocephalus attenuatus* and *Anabrus similis*.

T. Glover (Ill. N. A. Ent. Orth.) figures the following species: *Stenopelmatus talpa* (?), *St. fasciatus*; *Hadenœcus subterraneus*; *Ceuthophilus maculatus*, *C. lapidicola*, *C. Uhleri*; *Udeopsylla robusta*; *Daihina brevipes*; *Camptonotus Scudderi*; *Anabrus* (Pterolepis) *Haldemannii*, *A. simplex*; *Pterolepis* (Anabrus) *minutus*; *Thamnotrizon* (Decticus) *trilineatus*, *Th. dorsale*, *Th. scabricollis*; *Decticus pallidipalpus*; *Orch-*

elimum vulgare (=agilis); *Xiphidium fasciatum*, *X. brevipennis*; *Locusta fuliginosa*, *L. occidentalis*; *Conocephalus ensiger*; *Copiophora mucronata*; *Phaneroptera curvicauda*, *Ph. Coloradensis*; *Ephippitytha gracilipes*; *Phylloptera oblongifolia*; *Microcentrum retinervis*.

T. Glover (Monthly Repts. Dpt. Agr.) wingless grasshopper or "cricket" of Utah (*Anabrus simplex*)—Feb.; Notes on *Copiophora mucronata* (May and June).

S. H. Scudder (Am. Nat., Nov., 1872, 667) speaks of a fossil Locustarian about as large as our common Phylloptera, found in Wyoming Terr.

ACRIDIDÆ.

F. Walker (Cat. Dermap. Salt.—pt. iv) describes as new the following North American species and genera. *Cyrtacanthacris concolor*, Mexico; *C. simulatrix*, St. Domingo; *C. unilineata*, Indiana; *C. diversifera*, N. America; *Acridium proprium*, Oajaca; *Calacris* (n. gen) *pudica*, Mexico; *Chromacris* (n. gen.) in which he places *Acridium coloratum* Serv.; *Stenacris* (n. gen.) *chlorizans*, Florida; *Caloptenus repletus*, U. States; *C. bilituratus*, Vancouver's Island; *C. fasciatus*, St. Martin's Falls, Hudson's Bay; *C. scriptus*, Vancouver's Island; *C. extremus* and *C. arcticus*. Arctic America; *C. selectus*, Oajaca; *C. Mexicanus*, Orizaba; *Œdipoda parviceps*, W. coast of N. America; *Œ. transtrigata*, Oajaca; *Œ. aurifera*, St. Jago; *Œ. speciosa*, Honduras; *Stenobothrus subconspersus*, Florida; *S. Mexicanus*, Oajaca; *S. decisus*, St. Domingo; *Oxycoryphus tibialis*, Oajaca.

(Pt. v) *Choriphyllum plagiatum*. Jamaica.

(Suppl.) *Opomala stenobothroides*, Nicaragua; *Œdipoda tentatrix*, Oajaca; *Epicromia collecta*, St. Jago.

These volumes also contain descriptions of a number of new S. American species and genera

C. Thomas (Geol. Surv. Montana) describes as new *Acridium ambiguum*, Illinois. etc.; *A. frontalis*, Kansas; *Caloptenus viridis*, Colorado and Kansas; *C. Turnbullii*, Wyoming; *C. occidentalis*. Wyoming; *C. griseus*. Ohio; *Pezotettix obesa*, Montana; *P. Nebrascensis*, Nebraska; *Œdipoda undulata*. Colorado. etc.; *Œ. Haydenii*. Wyoming; *Œ paradoxa*, Utah; *Œ. gracilis*, Colorado; *Œ. Wyomingiana*. Wyoming; *Œ. Kiowa*. Colorado; *Œ. Montana*, Montana; *Œ. longipennis*. Kansas; *Stenobothrus bicolor*. Colorado; *Oxycoryphus obscurus*. Wyoming.

S. H. Scudder (Geol. Surv. Neb.) describes as new *Stenobothrus gracilis*; *Acridium emarginatum*; *Pezotettix speciosa*; *Œdipoda collaris*; *Œ. tenebrosa*; *Œ. Haldemannii*, all from Nebraska. He also mentions the following as found in that state, *Opsomala* (Opomala) *bivittata*; *Brachypeplus magnus*; *Caloptenus femur-rubrum*; *C. spretus*; *C. bivittatus*; *Œdipoda trifasciata*; *Œ. Carolina*; adds lengthy remarks on the destructive species, *C. femur-rubrum*, *C. spretus* and *Œdipoda atrox*.

T. Glover (Ill. N. Am. Ent. Orth.) figures the following species, *Opomala bivittata*; *Mesops Wyomingensis*; *Romalea centurio*; *Acridium Americanum*; *A. rubiginosum*, *A. obscurum*. *A. alutaceum*, *A. semirubrum*; *Caloptenus bivittatus*. *C. spretus*, *C. femur-rubrum*, *C. occidentalis*. *C. viridis*, *C. Dodgei*, *C. Turnbullii*. *C. griseus*, *C. differentialis*; *Pezotettix borealis*, *P. picta*, *P. obesa*. *P. Nebrascensis*, *P. unicolor*; *Oxycoryphus obscurus*; *Acrolophitus hirtipes*; *Stenobothrus admirabilis*, *St. maculipennis*, *St. longipennis*. *St. curtipennis*, *St. æqualis*; *Chloëaltis conspersa*, *Ch. viridis*; *Tragocephala viridifasciata*, *Tr. infuscata*;

Stauronotus Elliotti; Œdipoda eucerata, discoidea, corallipes, Carolina, phœnicoptera, sulphurea, rugosa, montana, cincta, undulata, maritima, pellucida, carlingiana, Haldemannii, atrox, marmorata, tenebrosa, trifasciata, verruculata, longipennis, carinata, sordida, æqualis; (Gryllus) *formosus;*[*] *Boopedon flavofasciatum, B. nubilum; Brachypeplus magnus, Br. virescens; Tettix ornata, T. lateralis; Tettigidea polymorpha; Batrachidea cristata; Phrynotettix verruculata.*

T. GLOVER (Monthly Repts. Dept. Agr.) Jan. Destructive grasshoppers in California, *Œdipoda atrox*, and notices of *Calop. femur-rubrum* and *spretus*. Nov. and Dec. Injuries by a large grasshopper (*Romalea microptera=centurio*).

PHASMIDÆ.

S. H. SCUDDER (Geol. Surv. Neb.) gives the locality in Nebraska where *Diapheromera Velii* is found.

T. GLOVER (Ill. N. Am. Ent. Orth.) figures the following species: *Diapheromera femorata; Anisimorpha buprestoides.*

MANTIDÆ.

S. H. SCUDDER (Geol. Surv. Neb.) describes the following new species: *Stagmatoptera minor*, Nebraska; *Temnopteryx marginata*, Nebraska.

T. GLOVER (Ill. N. Am. Ent. Orth.) figures the following species: *Mantis Carolina; M. Missouriensis*, and two undescribed species of Mantis.

NEUROPTERA.

E. DE SELYS LONGCHAMPS. Synopsis des Cordulines, 1871. (Published also in Bull. Acad. Belgique, 1871, pp. 238–316, 519, 565).

A. S. PACKARD, Jr. Embryological Studies on Hexapodous Insects. (3d. Mem. Peab. Acad. Sci.).

H. HAGEN (American Naturalist, vi, 388). Mimicry in the Colors of Insects. Though certain Coleoptera are referred to, the Neuroptera (Odonata) are also cited as the subjects studied in the investigation.

S. H. SCUDDER (Amer. Nat., vi, 665). Fossil Insects from the Rocky Mts. Two Neuroptera are cited.

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[*] This species does not belong to the Gryllidæ, but is the type of a new genus of *Acrididæ*, *Trapidolophus* Thomas MS.

R. Mc Lachlan (Ent. Month. Mag., London, viii, 1871, 100). *Bittacus apterus* nov. sp.

R. Mc Lachlan (Linnæan Society's Journal, Zoology, xi, 1871, 219). An attempt towards a systematic classification of the family *Ascalaphidæ.*

R. Mc Lachlan (Linn. Soc. Journ., xi, 1871, 98). On new forms, etc., of Extra European Trichopterous Insects.

LIBELLULIDÆ.

E. De Selys Longchamps (Syn. Cordulines, 1871) monographs the Cordulina of all the world, noticing the characteristics and localities of *Cordulia Shurtleffii* Scudder; *C. cynosura* Say; *C. semiaquea* Burm.; *C. costalis* De Selys; *C. princeps* Hagen; *Epitheca obsoleta* Say; *E. linearis* Hagen; *E. filosa* Hagen; *E. tenebrosa* Say; *E. elongata* Scudder; *E. Walshii* Scudder; *E. forcipata* Scudder; *E. septentrionalis* Hagen; *E. albicincta* Burm.; *Epophthalmia tæniolata* Ramb.; *Macromia cingulata* Ramb.; *M. Pacifica* Hagen; *M. annulata* Hagen; *M. Illinoiensis* Walsh; *M. transversa* Say; and describes as new *Cordulia libera*, *C. lepida*, *C. spinigera*, *C. basiguttata*, *C. Uhleri*, *C. regina*, *Epitheca procera*, *E. semicircularis*, *E. Hudsonica*, *E. cingulata*, from the United States and British North America.

HEMEROBIIDÆ.

A. S. Packard, Jr. (3rd. Mem. Peab. Acad. Sci., p. 11) describes and figures the embryology of *Chrysopa oculata* Say.

ASCALAPHIDÆ.

R. Mc Lachlan (Linn. Soc. Journ., xi, 1871) revises the American species of this group and describes as new *Haploglenius flavicornis* De Selys, Cuernavaca, Mexico; *Ulula Mexicana* Mexico; *U. ampla* St. Domingo.

PANORPIDÆ.

R. Mc Lachlan (Ent. Month. Mag. viii, 1871 (describes as new, with a figure, *Bittacus apterus*, from California.

PHRYGANEIDÆ.

R. Mc Lachlan (Linn. Soc. Journ., xi, 1871) describes as new *Stenophylax gentilis*, White Mts. N. H., *S. limbatus*, Pl. ii, fig. 2, Newfoundland; *Neophylax* (gen. nov.) *concinnus*, Pl. ii, fig. 3, New York; *Notidobia griseola*, Pl. ii, fig. 4, *N. nigricula*, Pl. ii, fig. 5; *Nosopus* (gen. nov.) *podager*, Pl. ii. fig. 6; *Heteroplictron Californicum*, Pl. iii, fig. 10, Cal.; *Macronema polygrammaticum*, Pl. iii, fig. 14, N. Amer.; *Smicridia* (nov. gen.) *fasciatella*, Pl. iv, fig. 19, Texas; *Tinodes consueta*, Pl. iv, fig. 22; *Agapetus celatus*, Pl. iv, fig. 23, Cal.

He also discusses the classification of the group and enumerates other N. American species.

ARACHNIDA.

W. LeBaron (2d Rep. Ins. Ill.). The Grasshopper Parasite (with a figure).

J. Leidy (Proc. Acad. Nat. Sci. Phila., Jan., 2, 138). On a Mite in the ear of the ox.

E. D. Cope (American Naturalist, vi, 406). On the Wyandotte Cave and its fauna.

PEDIPALPI.

E. D. Cope (Amer. Nat., vi, 421) describes and figures as new *Erebomaster flavescens* from Wyandotte Cave, Ind. and *Phrixis longipes* from Mammoth Cave, Ky.

ACARINA.

W. LeBaron (2d Rep. Ins. Ill.) describes as new *Atoma gryllaria* from Ill.; a parasite on *Caloptenus femur-rubrum.*

J. Leidy (Proc. Acad. Nat. Sci. Phila., Jan., 2 and 138) describes as new *Gamasus auris* found in the ear of the ox.

MYRIOPODA.

E. D. Cope (American Naturalist, vi, 406). On the Wyandotte Cave and its Fauna.

CHILOGNATHA.

E. D. Cope (Amer. Nat., vi, 414) notes the occurrence of *Spirostrephon cavernarum* Cope in Wyandotte Cave, Ind. He considers *Spirostrephon Copei* as the type of a distinct genus, *Scoterpes.*

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